S/183/60/000/004/010/014/XX
B004/B075

AUTHORS: Kanter, D. Ts., Leyni, A. A., Sokolova, O. N.

TITLE: The Properties of Dyes Soluble in Acetone

PERIODICAL: Khimicheskiye volokna, 1960, No. 4, pp. 31-39

TEXT: To a growing extent, dyes soluble in acetone are used for the dyeing of acetate rayon. They recently have been synthesized in the Derbenevskiy khimicheskiy zavod (Derbenevskiy Chemical Plant). Here, hydrophobic dyes with a Cr or Co 1:2 complex and the series "Orazol'", "Telazol'", and "Irgatset" were concerned. For the practical utilization of these dyes, their solubility must be known. In the preceding studies made in the physico-chemical laboratory of the authors' institute by means of an electron microscope with a resolving power of 50 A, V. P. Kovaleva has found that the solution of these dyes contains no visible particles. The authors discuss the solubility of the dyes at 20°C. The test portion of the dye (1-10 g, in some cases up to 30 g) was dissolved a) in 50 ml of acetone; b) in a 50-ml mixture consisting of 5% water and 95% acetone (the data obtained did not differ from those of a)); c) in a 50-ml mixture consisting of 10% ethanol and 90% methylene chloride. Solubility was determined gravimetrical-

ly as well as colorimetrically by means of an ФЭК-М (FEK-M) electrophotocolorimeter. 16 dyes were studied. Examples of the principal structure of these dyes are given. They belong to the following groups: 1) hydrophobic metal-containing monoazo dyes with Co or Cr 1:2 complex; 2) metal-containing monoazo dyes with Co or Cr 1:1 complex; 3) dyes for acetate rayon which are dispersed or soluble in fat; 4) a phenyl phthalocyanine dye with four heptyl sulfamide groups in the molecule. Fig. 1 shows the dissolution kinetics of these dyes. In all dyes a dependence of the concentration of their solution on the test portion was found. With a test portion of 30 g in 50 ml of acetone, the dye soluble in acetone yellow Г-19К (G-19K) attains a solubility of 436 g/l. For this reason, also the quantity of dye which remained unsolved in different test portions was determined. The proportion by weight between the dissolved and the undissolved portion is proposed as a new characteristic value for the evaluation of dyes and the elaboration of dyeing prescriptions. The solutions of dyes soluble in acetone are polydisperse; a partial association occurs. The solubility of hydrophobic metal-containing monoazo dyes with a 1:2 complex with a test portion of 5 g in 50 ml of acetone was on the average four times higher than that of the known dispersed dyes with a 1:1 complex. Introducing the rhodamine base into the dye structure lowers the solubility of the dye

in acetone, however, in ethanol methylene chloride it is considerably increased. In the NIOPiK im. K. Ye. Voroshilova (Scientific Research Institute of Organic Semifinished Products and Dyes imeni K. Ye. Voroshilov) good results were obtained in the dye fastness test with rayon dyed with these dyes. Reference is made to papers by Ye. A. Veller and B. A. Poray-Koshits, P. V. Moryganov and B. N. Mel'nikov, S. A. Pankova, O. M. Golosenko, and A. A. Cherkasskiy, S. M. Lipatov and I. M. Movshovich, Ye. G. Grimm, and T. A. Nekrasova. The authors thank Ye. M. Aleksandrova, Professor of the MKhTI im. D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev) for discussion and L. G. Krolik, Senior Scientific Worker of the Scientific Research Institute of Organic Semifinished Products and Dyes imeni K. Ye. Voroshilov, for synthesizing the phenyl phthalocyanine dye. There are 6 figures, 1 table, and 26 references: 20 Soviet, 1 US, 1 British, and 3 German.

ASSOCIATION: VNIIV (All-Union Scientific Research Institute of Synthetic Fibers)

Legend to the formulas: a) Blue K for acetate rayon; b) Dark red, soluble in fat; c) Bordeaux K, soluble in alcohol; d) Blue, soluble in alcohol; e) Yellow Z, soluble in alcohol; f) Orazol' blue 2V.
Legend to Fig. 1: Orazol' yellow 3R (20 g/50 ml); 2: Bordeaux K (10/50 ml) purified; 3: ditto 10 g/50 ml, unpurified; 4: Orange 4Zh (4Zh) 10 g/50 ml; 5: Bordeaux K 5 g/50 ml; 6: Orange 2Zh (2Zh) 5 g/50 ml; a) Duration of mixing, hours, b) Solubility g/l.

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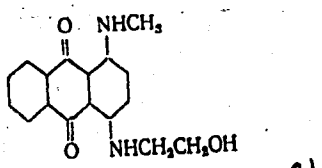
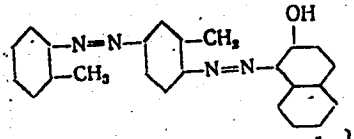
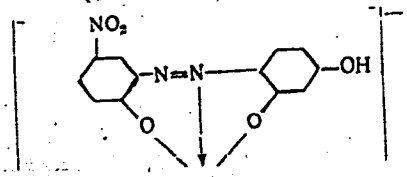
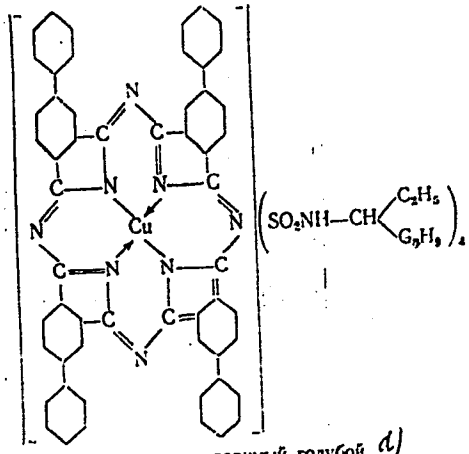


синий К для ацетатного шелка a)



жирорастворимый темно-красный b)





спирторастворимый голубой d)

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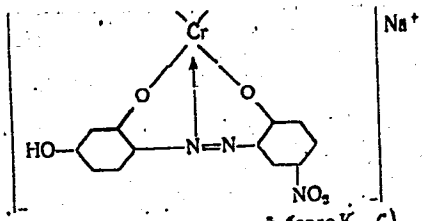
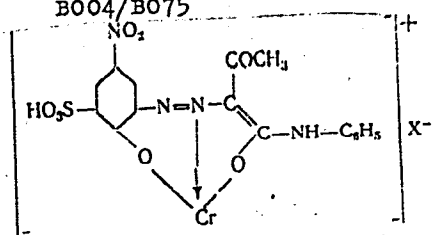
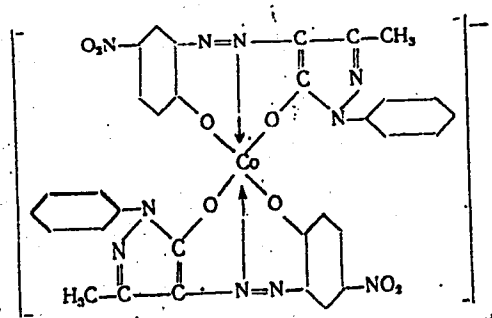


спирторастворимый бордо К c)



спирторастворимый желтый 3 e)



оразоль алый 2В f)

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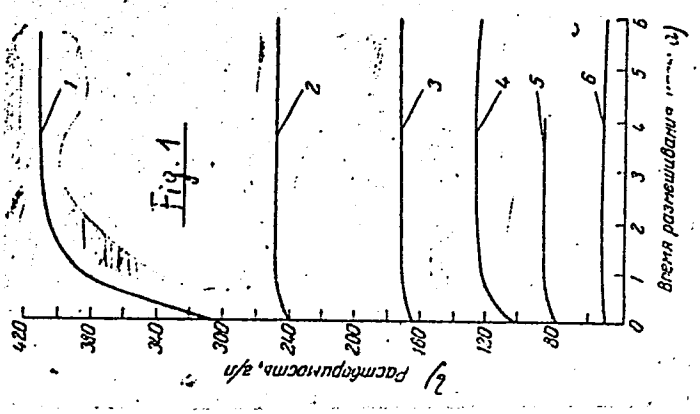

Fig. 1

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Method for stock dyeing of acetate rayon. Khim. volok. no.3: 46-50 '63. (MIRA 16:7)

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(Dyes and dyeing--Rayon)

1963/1

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DECEASED

c. 1960

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see ILC

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[Structural elements] Buvkonstrukcijas. Riga, Latvijas Valsts izd-ba. [In Latvian] (MIRA 17:6)

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1. Byvshiy student Leningradskogo universiteta.

LEYNOV, Ye.L.

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[Metal demountable headframe] Prokhodcheskie metallicheskie sborno-razbornye kopry. Moskva, Ugletekhizdat, 1954. 110 p. (MLRA 8:4)

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(Mine buildings)

LEYPTSIG, A.V.

History of the development of Mesozoic structures in the eastern margin of the Siberian Platform. Geol.i geofiz. 4:34-43 '62.
(MIRA 15:8)

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(Siberian Platform—Geology, Structural)

LEYPTSIG, A.V.

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History of the formation of structures in the eastern regions of the Siberian Platform. Trudy VSEGEI 97:11-29 '64. (MIRA 17:8)

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Acad Aci. USSR Moscow

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"Application of Po + Ve and AC + Be neutron sources in well-logging."

report to be submitted for the Conference on Nuclear Geophysics, Krakow, Poland, 24-30 Sept 1962.

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"Quick neutron activation analysis of Al, Si, Mn, V."

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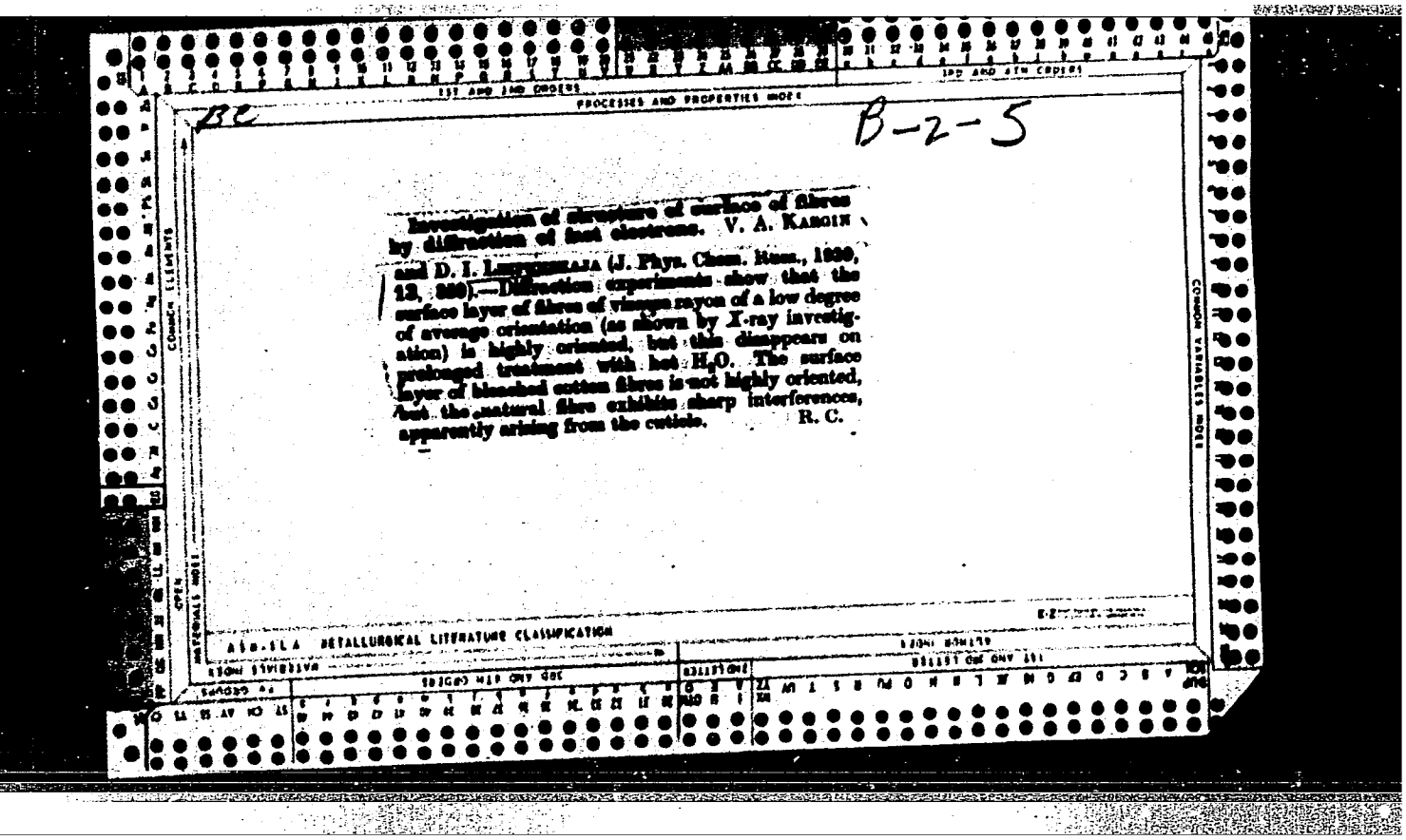
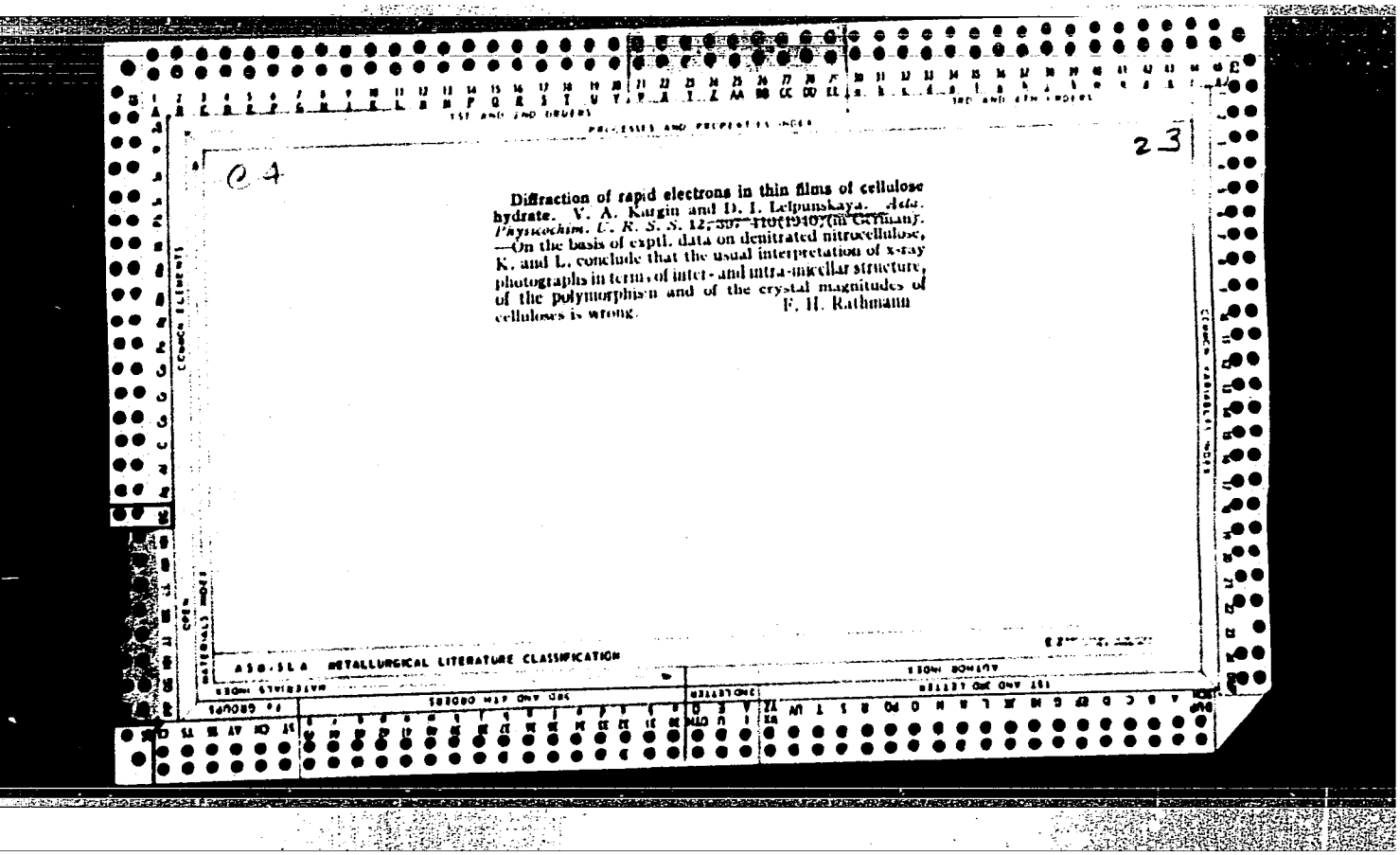


BC

B-2-5

Investigation of structure of surface of fibres by diffraction of fast electrons. V. A. KARGIN and D. I. LAVRENTJEJA (J. Phys. Chem. Russ., 1939, 13, 399).—Diffraction experiments show that the surface layer of fibres of viscose rayon of a low degree of average orientation (as shown by X-ray investigation) is highly oriented, but this disappears on prolonged treatment with hot H_2O. The surface layer of bleached cotton fibres is not highly oriented, but the natural fibre exhibits sharp interferences, apparently arising from the cuticle. R. C.



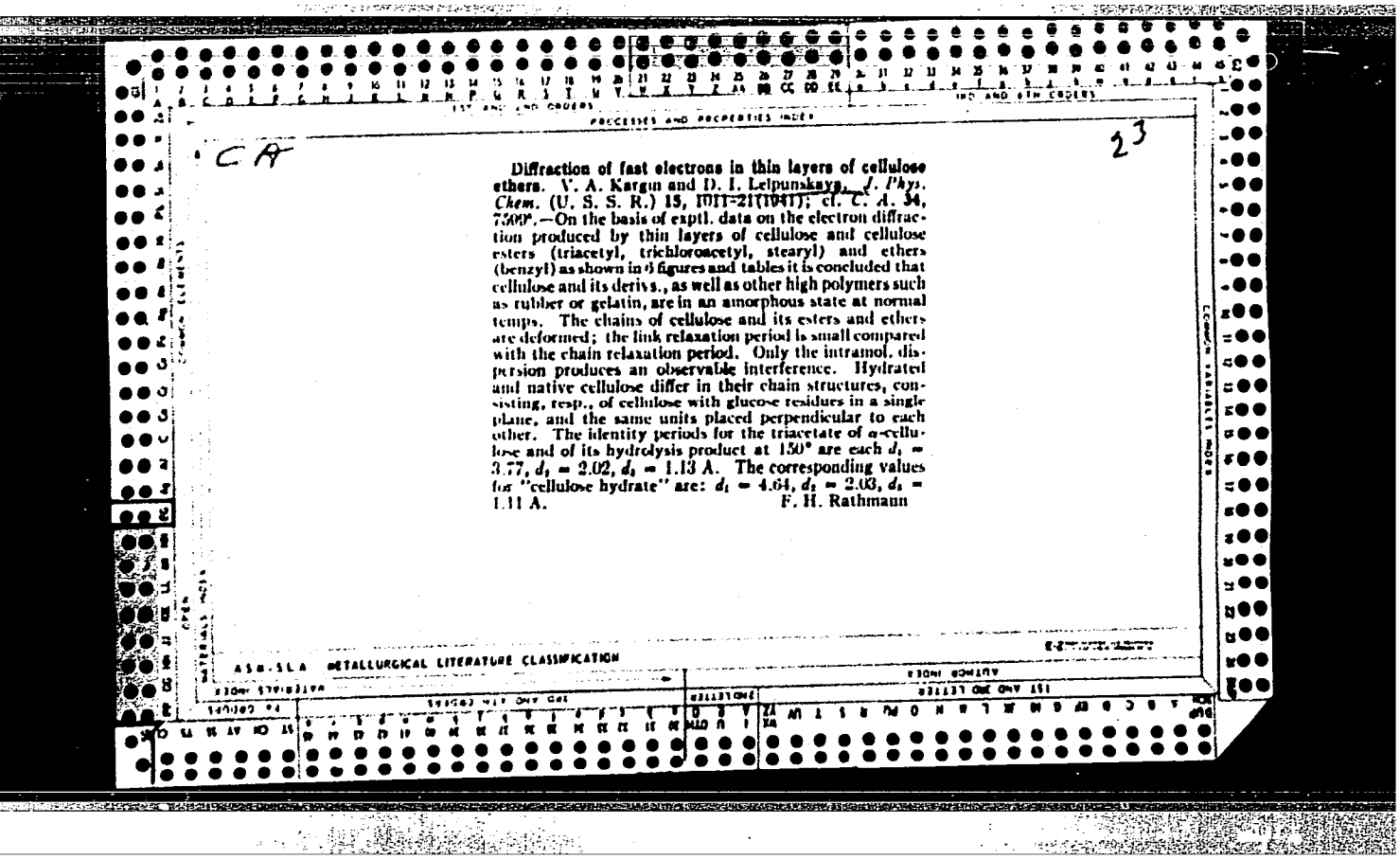
Diffraction of rapid electrons in thin films of cellulose hydrate. V. A. Kargin and D. I. Lelpunskaya. *Acta Physicochim. U. R. S. S.* 12, 397–410(1940)(in German). —On the basis of exptl. data on denitrated nitrocellulose, K. and L. conclude that the usual interpretation of x-ray photographs in term, of inter- and intra-micellar structure, of the polymorphism and of the crystal magnitudes of celluloses is wrong. F. H. Rathmann

KARGIN, V. A.; LEYPUNSKAYA, D. I.

Laboratory of Colloidal Chemistry, Moscow Physico-Chemical Institute imeni L. Ya. Karpov, (-1940-).

"The Diffraction of High-Speed Electrons in Thin Layers of Hydrocellulose."

Zhur. Fiz. Khim., Vol. 14, No. 3, 1940.



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Diffraction of fast electrons in thin layers of cellulose ethers. V. A. Kargin and D. I. Lelpunskaya. *J. Phys. Chem.* (U. S. S. R.) 15, 1011-21(1941); cf. *C. A.* 34, 7500⁹.—On the basis of exptl. data on the electron diffraction produced by thin layers of cellulose and cellulose esters (triacetyl, trichloroacetyl, stearyl) and ethers (benzyl) as shown in 6 figures and tables it is concluded that cellulose and its derivs., as well as other high polymers such as rubber or gelatin, are in an amorphous state at normal temps. The chains of cellulose and its esters and ethers are deformed; the link relaxation period is small compared with the chain relaxation period. Only the intramol. dispersion produces an observable interference. Hydrated and native cellulose differ in their chain structures, consisting, resp., of cellulose with glucose residues in a single plane, and the same units placed perpendicular to each other. The identity periods for the triacetate of α-cellulose and of its hydrolysis product at 150° are each d_1 = 3.77, d_2 = 2.02, d_3 = 1.13 A. The corresponding values for "cellulose hydrate" are: d_1 = 4.64, d_2 = 2.03, d_3 = 1.11 A.

F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LEYPUNSKAYA, D.I.; YERPYLEVA, Ye.R.; NOVIKOVA, K.A.; PRUSLIN, Ya.A.

Radiometric method for controlling oil saturation in the studies of bubble point oil flow in hydrohynamic models of porous media. Trudy VNII no.10:349-356 '57. (MIRA 14:6)
(Oil reservoir engineering)

LEYPUNSKAYA, D.I.

EPSHTEYN, David Arkal'yevich, professor, doktor tekhnicheskikh nauk; LEYPUNSKAYA, D.I., redaktor; PROFERANSOVA, N.V., redaktor; SOKOLOVA, R.Ya., tekhnicheskiy redaktor

[Principles of chemical technology; a book for teachers] Osnovy khimicheskoi tekhnologii; kniga dlia uchitelia. Moskva, Izd-vo Akad. pedagog. nauk RSFSR, 1957. 222 p. (MLRA 10:5)
(Chemistry, Technical)

LEYPUNSKAYA, D.I.

10(4); 21(5); 24(8) PHASE I BOOK EXPLOITATION SOV/2457

Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniy v narodnom khozyaystve i nauke. 2d, Moscow, 1957

Teplotekhnika i gidrodinamika; trudy konferentsii, tom. 4 (Heat Engineering and Hydrodynamics; Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science, Vol 4) Moscow, Gosenergoizdat, 1958. 88 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR, and USSR. Glavnoye upravleniye po ispol'zovaniyu atomnoy energii.

Eds.: M. A. Styrikovich (Resp. Ed.), G. Ye. Kholodovskiy, and M. S. Fomichev; Ed. of Publ. House: L. M. Sinel'nikova; Tech. Ed.: N. I. Borunov.

PURPOSE: This collection of articles is intended for scientists and laboratory workers concerned with the use of radioactive and stable isotopes.

COVERAGE: This collection of papers deals with the application of radioactive and stable isotopes as measuring tools in various types of scientific investigation. No personalities are mentioned. References are given after some of the articles.

2. Bartolomey, G.G., Ya.G. Vinokur, V.A. Kolokol'tsev, and V.I. Petukhov. Use of Gamma Rays for Studying the Process of Diffusion 9

3. Kutateladze, S.S., and V.N. Moskvicheva. Use of Gammaradioscopy for Studying the Hydrodynamics of a Multifluid System 12

4. Poletavkin, P.G., and N.A. Shapkin. Method of "Tagged" Atoms for Investigating Water and Steam Content in Surface Boiling of a Fluid 16

5. Kudryavtsev, V.S. Determining the Specific Surface Area of Quartz and Cement Powders by the Sorption Method With the Use of "Tagged" Atoms 20

6. Moskvin, V.M., and I.I. Kurbatova. Use of Radioactive Isotope S^{35} for Studying Sulfate Corrosion of Concrete 28

7. Tsytovich, N.A., V.I. Ferronskiy, and V.A. Lukin. Methods for Determining the Density and Moisture Content of Soils With the Aid of Radioactive Emissions 33

8. Polozova, L.G., and R.P. Reyzman. Study of the Processes of Moisture Transfer in Building Materials by Means of Gammaradioscopy 38

9. Styrikovich, M.A., I.Kh. Khaybullin, and L. K. Khokhlov. Use of Radioactive Isotopes for Investigating the Solubility of Salts in Water Vapor at High Pressures 41

10. Sterman, L.S., A.Ya. Antonov, and A.V. Surnov. Investigation of the Characteristics of Vapor at a Pressure of 185 abs. atm. With the Aid of Radioactive Isotopes 46

11. Dubrovskiy, V.A. Use of Radioactive Isotopes for Observing the Motion of the Molten Glass Mass in Glass Furnace Tanks 52

12. Rachinskiy, V.V. Use of Radioactive Isotopes in Studying the Filtration of Fluids Through Porous Media 57

13. Leypunskaya, D.I., and A.Ya. Pruslin. Radioisotope Methods for Investigating Flow Processes of Fluids in a Porous Medium 62

14. Borts, M.A., L.S. Zarubin, V.S. Kaminskiy, and L.L. Korsak. Investigation of the Hydrodynamics of a Fluid in the Conical Rotor of a Settling Centrifuge With the Aid of Radioactive Isotopes 67

15. Volarovich, M.P., N.V. Churayev, and B.Ya. Minkov. Investigations of the Motion of Water in Peat Under Laboratory and Field Conditions With the Use of Radioactive Isotopes 72

16. Arkhangel'skiy, M.M. Use of Radioactive Isotopes for Investigating Suspensions of River Silt 78

17. Veynik, A.I., and A.S. Shubin. Use of Radioactive Isotopes for Investigating the Mechanism of the Drying Process 85

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LEYPUNSKAYA, D.I.; PRUSLIN, Ya.A.; YERPYLEVA, Ye.R.; NOVIKOVA, K.A.

Radioactive method for studying the displacement of fluids from porous media. Trudy VNII 12:361-367 '58. (MIRA 12:3)
(Oil field flooding) (Hydraulic modeling)

LEYPUNSKAYA, D.I.

PHASE I BOOK EXPLOITATION SOV/3600

Yadernaya geofizika; sbornik statey po ispol'zovaniyu radioaktivnykh izlucheniy i izotopov v geologii nefti (Nuclear Geophysics; Collection of Articles on the Use of Radioactive Radiation and Isotopes in Petroleum Geology) Moscow, Gostoptekhizdat, 1959. 370 p. Errata slip inserted. 4,000 copies printed.

Ed.: F.A. Alekseyev, Professor, Doctor of Geological and Mineralogical Sciences; Exec. Ed.: A.P. Kalantarov; Tech. Ed.: A.S. Polosina.

PURPOSE: This book is intended for petroleum geologists, geophysicists and scientists engaged in geological research who are interested in radiometric techniques of petroleum prospecting.

COVERAGE: The collection contains 28 articles compiled by staff members and aspirants of the Laboratory for Nuclear Geology and Geophysics of the Petroleum Institute (now the Institute for Geology and Mineral Fuel Processing) of the Academy of Sciences USSR, the Laboratory for Radioactive Logging of the All-Union Scientific Research Institute of Geophysics, and the heads of councils for planning research projects for petroleum enterprises. The articles treat new material on radiometric surveying in petroleum geology, describe radiometric instruments (counters, etc.) for registering neutrons and gamma rays, give the results of research with models of rock strata, introduce fundamentals of a new method for effectively utilizing radioactivity in the analysis of rock samples from petroleum-survey bore holes, etc. Problems of method in the study and interpretation of radiometric measurements in bore holes are reviewed, as well as the results of studies in the nonabsorption of tritium in tracing the movement of petroleum and water in a stratum. Finally, a new method of surveying based on measuring the radioactivity of the surface of a prospective petroleum deposit is described. No personalities are mentioned. References accompany each article.

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Rezvanov, R.A. Possibility of the Method of Induced Radioactivity for Quantitative Evaluation of the Petrolific Capacity and Other Characteristics of Strata 103

Blankova, T.N. The Effectiveness of the Methods of Induced Radioactivity of Sodium and Chlorine to Compute the Oil- and Water-Bearing Capacity of Devonian Sandstones 110

Burov, B.M., G.N. Darvoyd, F.Ts. Denisik, B.P. Odinokov, and V.G. Shcherbinskiy. Utilization of Epithermal Neutrons in the Neutron-Neutron Method (NNM) of Evaluating the Porosity of Sand and Carbonate Collectors 121

Alekseyev, F.A., S.A. Denisik, Y.Y. Miller, and V.P. Odinokov. The Use of Gamma-Ray Spectrometry to Investigate Bore Holes 134

Guberman, Sh. A. Gamma-Ray Spectroscopy of Natural and Artificial Radioactive Isotopes Under Bore Hole Conditions 146

Odinokov, V.P., S.A. Denisik, and Yu. S. Shimelevich. Determination of the Point of Water-Petroleum Contact From Data Obtained Using the Neutron Gamma Method With Scintillation Counters (NGM-LS) and the Neutron-Neutron Method Based on Thermal Neutrons (NNM-T) 154

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Dvorkin, I.L., and R.A. Rezvanov. The Use of Scintillation Counters to Count Slow Neutrons in Petroleum Survey Bore Holes 187

Zolotov, A.V. Distribution of Slow Neutrons in a Homogeneous Medium 195

Gulin, Yu.A. Influence of the Conditions of Measuring Upon Evaluating the Porosity of Rock According to Data Obtained by the Neutron Gamma Method 201

Rudnev, O.V. Development of New Types of Radiometric Apparatus for Use in Petroleum Survey Operations 222

Talay, L.L. The Problem of Determining the Point of Water-Petroleum Contact Under Conditions of Cased Wells in Carbonate Deposits 230

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Yermakov, V.I., A.I. Laubenbakh, M.G. Ovanesov, Yu. A. Romanov, and L.N. Skosyreva. Results of Investigations of Natural Gamma Fields in Oil-Bearing Regions, Using Aerial and Ground Radiometric Survey Methods 264

SOV/89-6-3-10/29

21(4), 7(5)

AUTHORS: Leypunskaya, D. I., Gauer, Z. Ye., Flerov, G. N.

TITLE: Neutron Activation Analysis of Samples of Rock and Ore Concentrates (Neytronnyy aktivatsionnyy analiz obraztsov gornykh porod i rudnykh kontsentratov)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 3, pp 315-320 (USSR)

ABSTRACT: The rock samples are examined in a paraffin block which contains a Po+Be-neutron source and an irradiation duct. The neutron source emits $\sim 10^7$ n/sec. The material to be investigated is introduced into the duct and irradiated, according to what element is to be detected, approximately for 20 minutes. The forming activities are due to (nγ)- and (np)-reactions. The formed radioactivity is investigated as to its β- and γ-radiation. In order to be able to carry out better measurements of the β-energies the radioactive samples are powderized and filled into a cylindrical canning with double walls consisting of material which cannot be activated. The inner wall of the canning is produced from a thin foil. The thickness of the layer of the sample in the canning is greater than the maximum range of the β-rays. The length of the canning

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is ~8 cm. During the measurement the canning is moved over a thin-walled β-counter. The γ-radiation was measured by means of a scintillation counter combined with a one-channel amplitude-analyzer. The processes of measurement are described for the determination of aluminum, manganese, vanadium, silicon, and indium in rocks of complex composition. In this connection the concentration of these elements in the rock samples must be relatively high. The analysis can be carried out very rapidly since the most short-lived isotope of the element to be determined can be used as an indicator. The effect of interference activities is taken into account in every element to be determined and it is pointed out how this interference activity can be detected. The sensitivity of the developed method to the individual elements is the following: Al ~5%, Si 7 - 10%, V 10^{-1}%, In 10^{-2}% and Mn 10^{-2}%. By using the portable neutron multiplier described in reference 6 it is possible to increase the sensitivity of this activation method by 1 1/2 to 2 orders of magnitude, and thus also small concentrations of elements to be investigated can be detected. F. A. Alekseyev showed interest in this paper. There are 2 figures, 1 table, and 6 references, 3 of which are Soviet.

LEYPUNSKAYA, O. I.

LATYSHEV, G. D.

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PHASE I BOOK EXPLOITATION SOV/5410

Tashkentskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii. Tashkent, 1959.

Trudy (Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960. 449 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk Uzbekskoy SSR.

Responsible Ed.: S. V. Starodubtsev, Academician, Academy of Sciences Uzbek SSR. Editorial Board: A. A. Abdullayev, Candidate of Physics and Mathematics; D. M. Abdurasulov, Doctor of Medical Sciences; U. A. Arifov, Academician, Academy of Sciences Uzbek SSR; A. A. Borodulina, Candidate of Biological Sciences; V. N. Ivashev; G. S. Ikramova; A. Ye. Kiv; Ye. N. Lobanov, Candidate of Physics and Mathematics; A. I. Nikolayev, Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

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Transactions of the Tashkent (Cont.) SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE : The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

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Transactions of the Tashkent (Cont.) SOV/5410

instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

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Lopovok, T. A. [Institute of Geology and Production of Mineral Fuels AS USSR]. Neutron Breeder for Activation Analysis

LEYPUNSKAYA, O. I.

PHASE I BOOK EXPLOITATION SOV/5592

Vsesoyuznoye soveshchaniye po vnedreniyu radioaktivnykh izotopov i yadernykh izlucheniy v narodnom khozyaystve SSSR. Riga, 1960.

Radioaktivnyye izotopy i yadernyye izlucheniya v narodnom khozyaystve SSSR; trudy Vsesoyuznogo soveshchaniya 12 - 16 aprelya 1960 g. g. Riga, v 4 tomakh. t. 4: Poiski, razvedka i razrabotka poleznykh iskopayemykh (Radioactive Isotopes and Nuclear Radiation in the National Economy of the USSR; Transactions on the Symposium Held in Riga, April 12 - 16, 1960, in 4 volumes. v. 4: Prospecting, Surveying, and Mining of Mineral Deposits) Moscow, Gostoptekhizdat, 1961. 284 p. 3,640 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov SSSR. Gosudarstvennyy komitet Soveta Ministrov SSSR po ispol'zovaniyu atomnoy energii

Eds. (Title page): N. A. Petrov, L. I. Petrenko, and P. S. Savitskiy; ed. of this volume: M. A. Speranskiy; Scientific ed.: M. A. Speranskiy; Executive Eds.: N. N. Kuz'mina and A. G. Ionel';

Card 1/11

Radioactive Isotopes and Nuclear (Cont.) SOV/5592

Tech. Ed.: A. S. Polosina.

PURPOSE : The book is intended for engineers and technicians dealing with the problems involved in the application of radioactive isotopes and nuclear radiation.

COVERAGE: This collection of 39 articles is Vol. 4 of the Transactions of the All-Union Conference of the Introduction of Radioactive Isotopes and Nuclear Reactions in the National Economy of the USSR. The Conference was called by the Gosudarstvennyy nauchno-tekhnicheskiy komitet Sovet Ministrov SSSR (State Scientific-Technical Committee of the Council of Ministers of the USSR), Academy of Sciences USSR, Gosplan SSSR (State Planning Committee of the Council of Ministers of the USSR), Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu (State Committee of the Council of Ministers of the USSR for Automation and Machine Building), and the Council of Ministers of the Latvian SSR. The reports summarized in this publication deal with the advantages, prospects, and

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Radioactive Isotopes and Nuclear (Cont.) SOV/559:

development of radioactive methods used in prospecting, surveying, and mining of ores. Individual reports present the results of the latest scientific research on the development and improvement of the theory, methodology, and technology of radiometric investigations. Application of radioactive methods in the field of engineering geology, hydrology, and the control of ore enrichment processes is analyzed. No personalities are mentioned. There are no references.

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S/169/61/000/012/035/089
D228/D305

AUTHORS: Leypunskaya, D. I., Rezvanov, R. A., and Drynkin, V. I.

TITLE: Application of neutron activation analysis in geology

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 12, 1961, 43, abstract 12A408 (V sb. Yadern. geofiz. pri poiskakh polezn. iskopayemykh. M., Gostoptekhizdat, 1960, 162-173)

TEXT: The possibility of applying activation analysis for determining the elemental composition of sedimentary rocks is discussed. On the basis of analysis of the neutron activation characteristics of elements and of their concentrations in sedimentary rocks, it is concluded that on the activation of neutron flows at 10^3 - 10^4 neutrons/cm^2 sec. analyses may be made for Na, Al, Si, Cl, and Mn, and that they may be made for

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D228/D305

Application of neutron...

F, Mg, P, S, K, Ca, and others when the flows are 10^2 - 10^3 times still greater. When carrying out the analyses, the authors used activation by both slow and fast neutrons. Samples were activated either by means of Po-Be sources with a general intensity of 10^6 - 10^7 neutrons/sec. placed in a paraffin block, or by means of the HP-1 (NR-1) neutron propagator. The latter is a subcritical reactor system. The stream of thermal neutrons in the experimental channels of the NR-1 corresponds to the flow from the Po-Be source with a power of 500 - 750 curies placed in the paraffin block. The count-rates of β -rays during the activation of pure compounds of certain elements in the NR-1 are given. The analytical sensitivity during the activation in the NR-1 is adequate for measuring the Al, V, Cu, Co, Mn, In, Au, and Ag contents of rocks at concentrations that are of commercial interest. The recording of β -rays was made by AC-1 (AS-1) and AC-2 (AS-2) counters, the γ -rays being registered by means of a one-channel scintillation spectrometer.

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FILIPPOV, Yevgeniy Mikhaylovich. Prinimali uchastiye: GUBERMAN, SH.A.; LEYPUNSKAYA, D.I., nauchnyy sotr., red.; BESPALOV, D.F., nauchnyy sotr., red.; SREBRODOL'SKIY, D.M., nauchnyy sotr., red.; SHIMELEVICH, Yu.S., nauchnyy sotr., red.; TEMKIN, A.Ya., red.; MEDER, V.M., red. izd-va; PRUSAKOVA, T.A., tekhn. red.; MAKUNI, Ye.V., tekhn. red.

[Applied nuclear geophysics; use of sources of nuclear radiation in geology and geophysics]Prikladnaia iadernaia geofizika; primenenie istochnikov iadernogo izlucheniia v geologii i geofizike. Pod obshchei red. L.S.Polaka. Moskva, Izd-vo Akad. nauk SSSR, 1962. 579 p. (MIRA 15:12)

1. Chlen-korrespondent Akademiya nauk SSSR (for Filippov). 2. Institut geologii i razrabotki goryuchikh iskopayemykh (for Leypunskaya, Bespalov, Srebrodol'skiy, Shimelevich). 3. Institut neftekhimicheskogo sinteza Akademii nauk SSSR (for Temkin).
(Nuclear geophysics)

KAIPOV, R.L.; ZIV, D.M.; LEYPUNSKAYA, D.I.; SAVOSIN, S.I.; FEDOROV, V.V.; FRADKIN, G.M.; SHIMELEVICH, Yu.S.; BASIN, Ya.N.; KUKHARENKO, N.K.; SMESTAKOV, B.I.

Use of Ac - Be neutron sources in industrial geophysics. Atom energ. 16 no.3:269-270 Mr '64. (MIRA 17:3)

ACCESSION NR: AP5014491 UR/0286/65/000/006/0695/0699

543.53

AUTHOR: Leypunskaya, D. I.

TITLE: Utilization of neutron multipliers and generators in neutron activation analysis

SOURCE: Zavodskaya laboratoriya, v. 31, no. 6, 1965, 695-699

TOPIC TAGS: neutron, neutron flux, neutron radiation, atomic reactor, activation analysis, isotope, fast neutron, thermal neutron

ABSTRACT: The usefulness of neutron multipliers and generators in analyzing fast neutron radiation processes, as well as in many other activation analyses, is discussed because of the excellent sensitivity of the [illegible] The neutron multiplier consists of a subcritical [illegible] with an external source for initiating the [illegible] either in a laboratory or in the field. The most [illegible] activation analysis of isotopes with half-lives greater than [illegible] used as an analytic research tool, [illegible] logical controls, etc. A table is presented to demonstrate the multiplier sensitivity used in 25 isotope activation analyses. The neutron generator used in

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ACCESSION NR: AP5014491

activation analysis consists of an adjustable neutron source and an accelerator. The generator can produce 10^{12} - 10^{13} neutrons/sec and consequently can be used in analyses of the type (n, γ), reactions under the action of both thermal and super-thermal neutrons. It is also useful in [illegible] A [illegible] table shows the sensitivity of the neutron generator in [illegible] reactions with seven different isotopes. Orig. art. has: 4 tables and 1 formula.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 013 OTHER: 003

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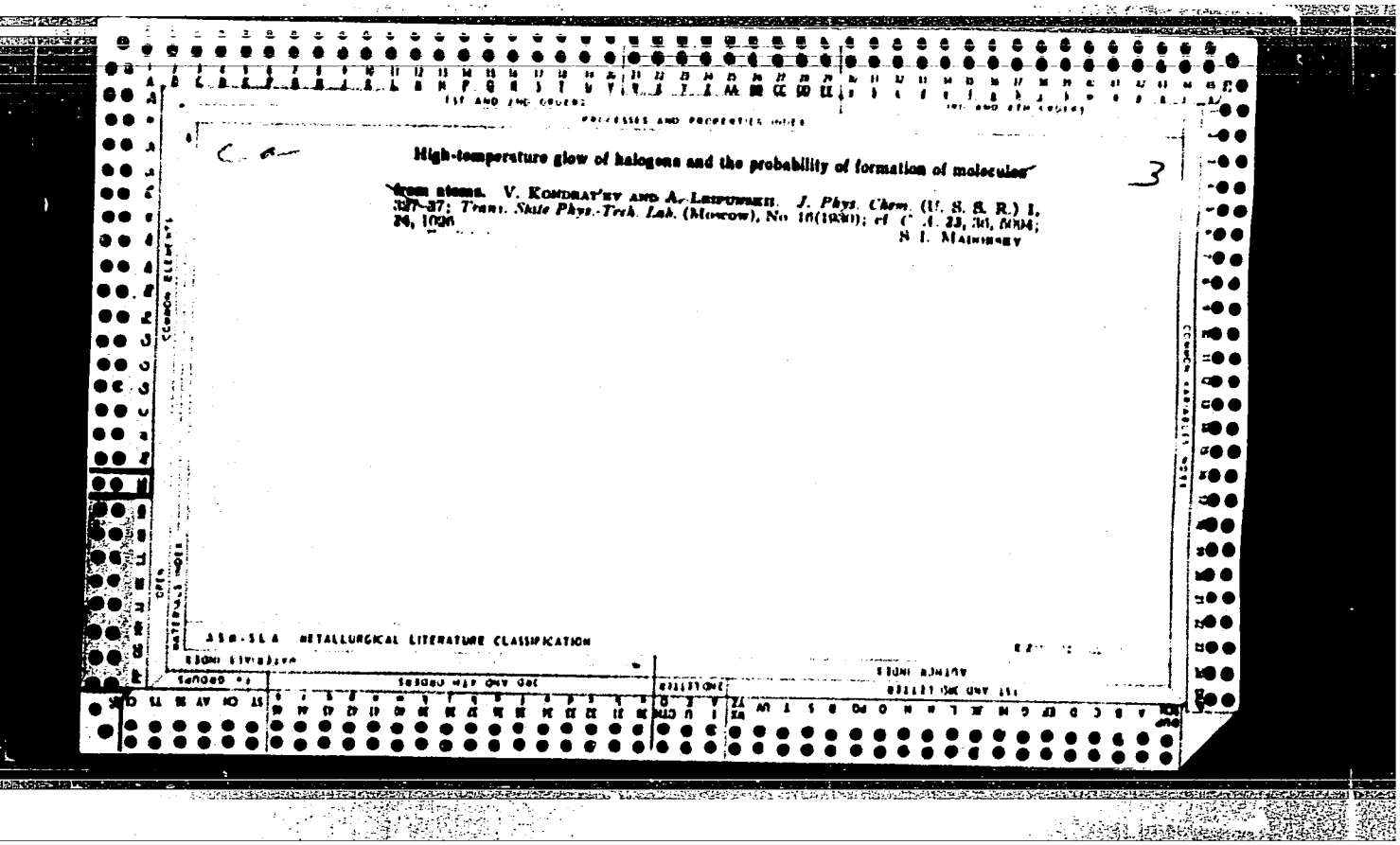
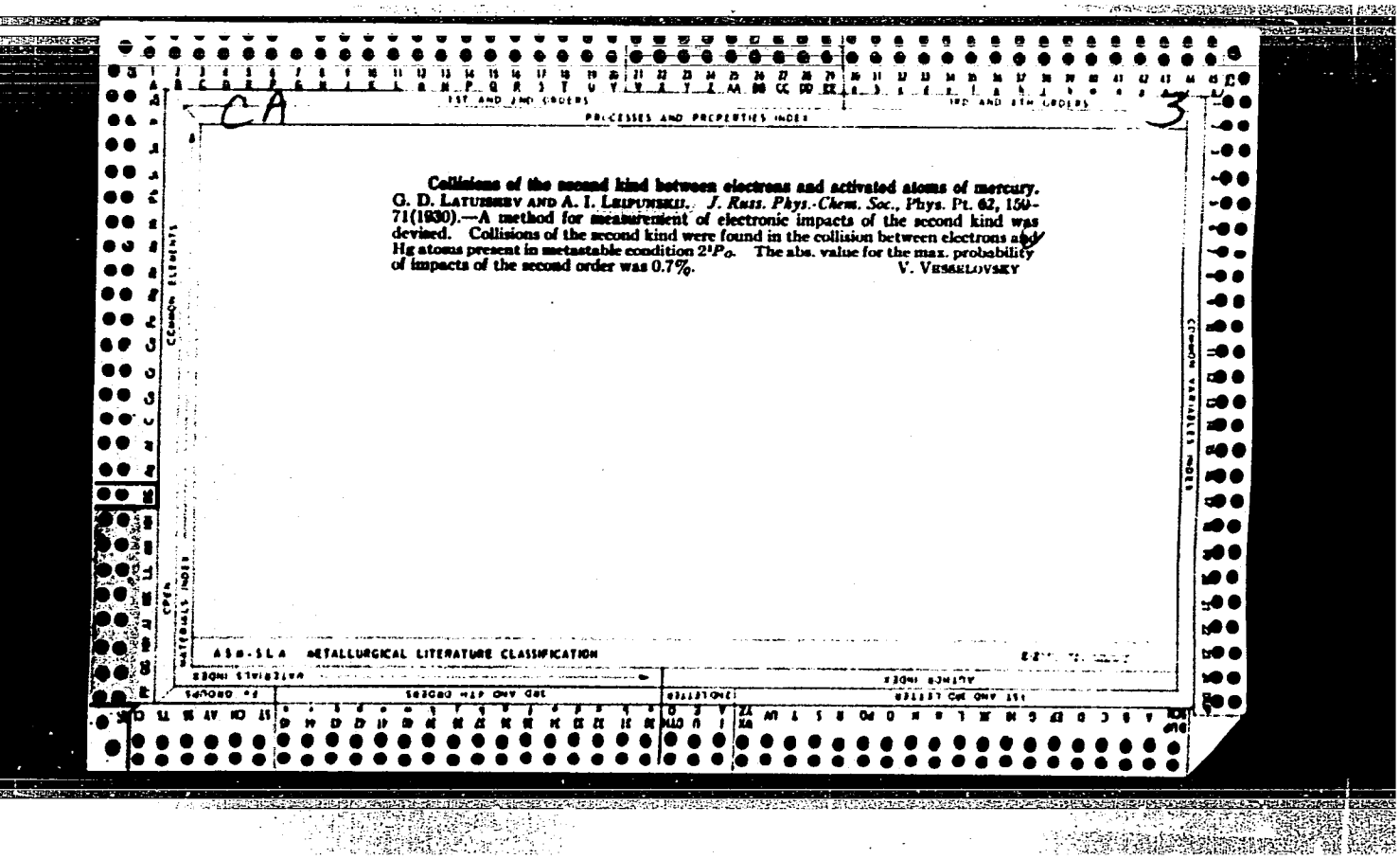


High-temperature glow of halogens and the probability of formation of molecules from atoms. V. Kondrat'ev and A. Leipunskii. *J. Phys. Chem.* (U. S. S. R.) 1, 327–37; *Trans. State Phys.-Tech. Lab.* (Moscow), No. 16(1930); cf. *C. A.* 23, 761, 8004; 24, 1098.

S. I. Mainisheev



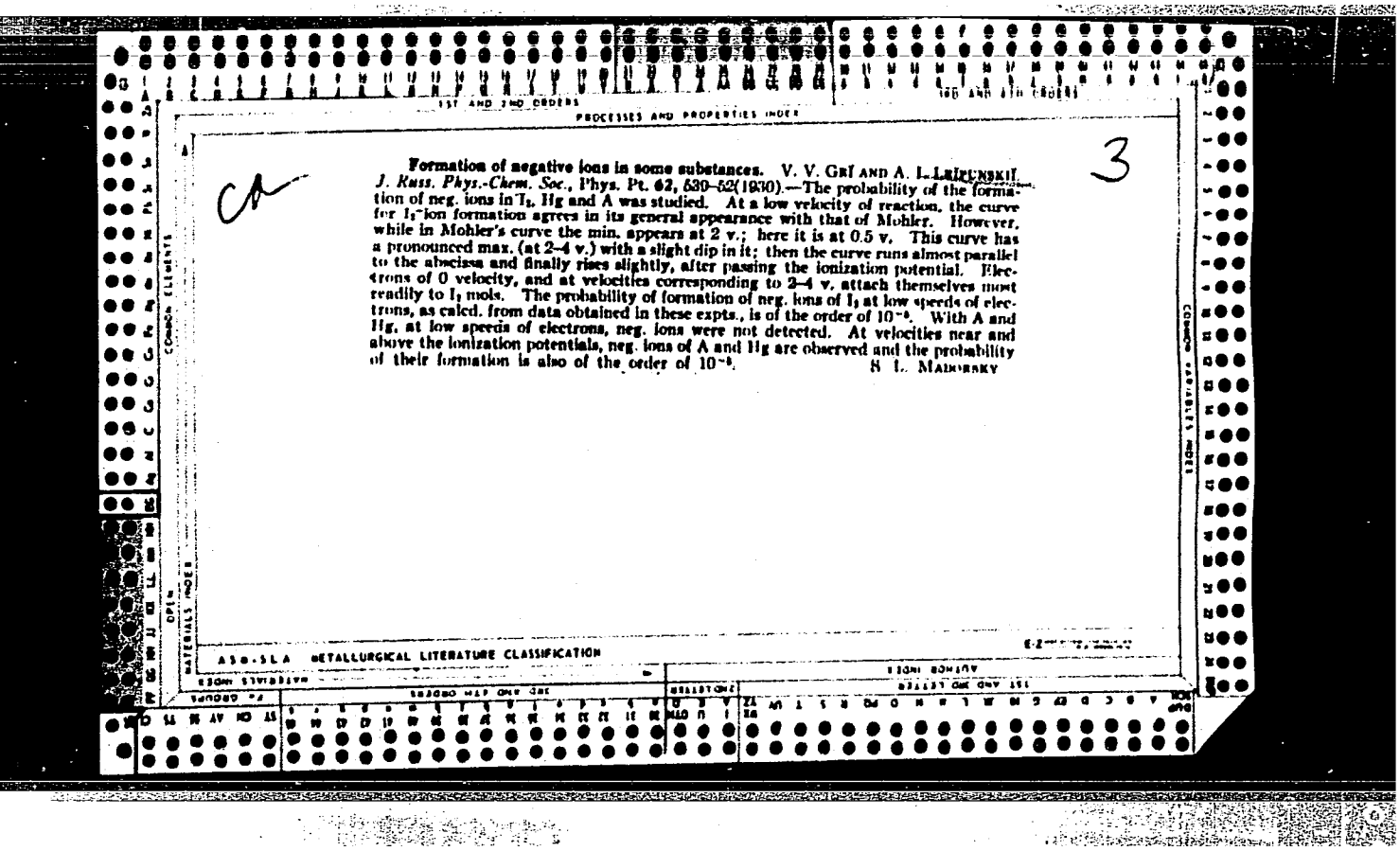
CA

3

PROCESSES AND PROPERTIES INDEX

Collisions of the second kind between electrons and activated atoms of mercury. G. D. LATUSHKEV AND A. I. LEIPUNSKII. *J. Russ. Phys.-Chem. Soc., Phys.* Pt. 62, 159–71(1930).—A method for measurement of electronic impacts of the second kind was devised. Collisions of the second kind were found in the collision between electrons and Hg atoms present in metastable condition 2^1P_0. The abs. value for the max. probability of impacts of the second order was 0.7%. V. VESSELOVSKY

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

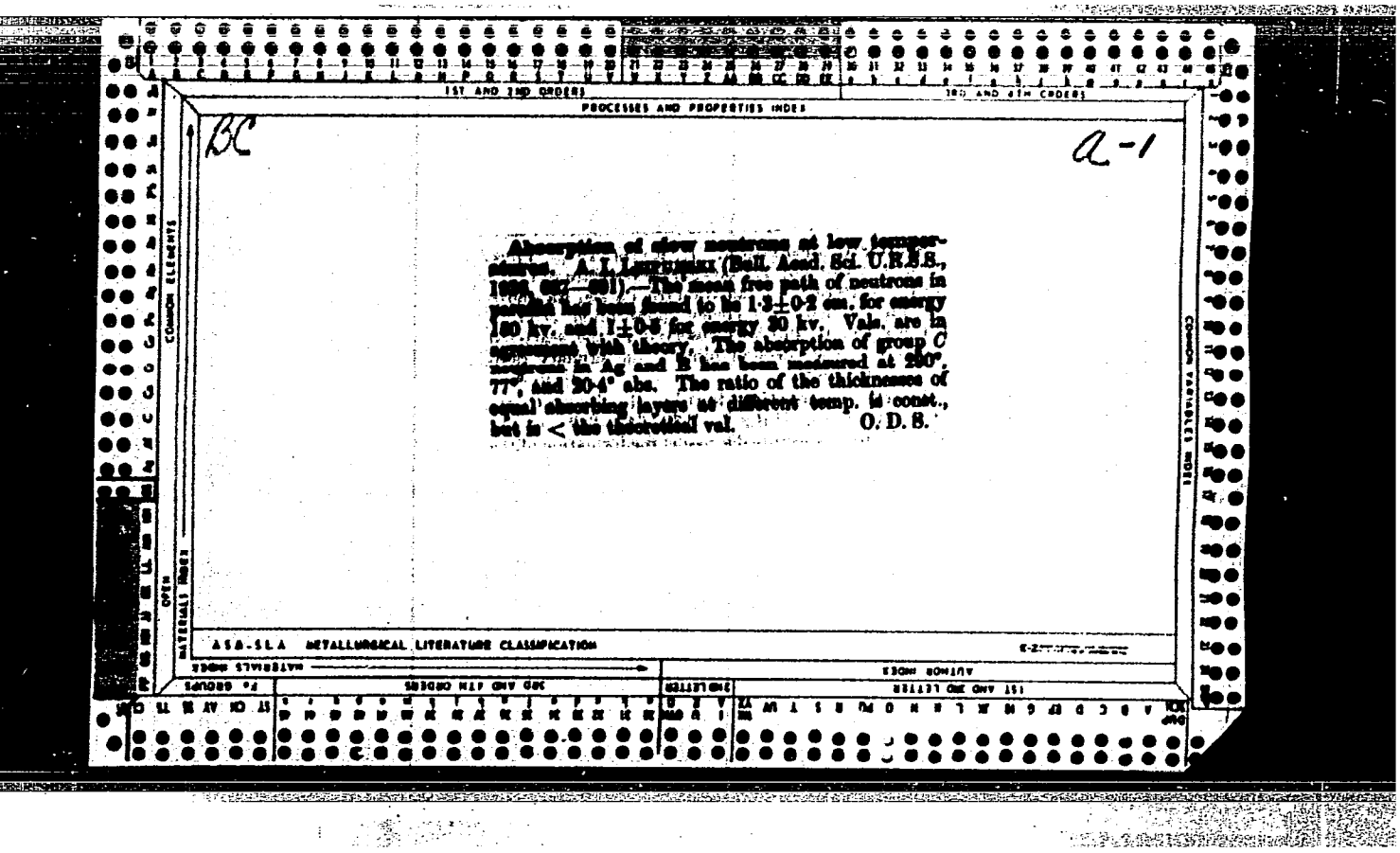
CA

3

Formation of negative ions in some substances. V. V. GRI AND A. L. LEIPUNSKII. *J. Russ. Phys.-Chem. Soc.*, Phys. Pt. **62**, 539–52(1930).—The probability of the formation of neg. ions in I_2, Hg and A was studied. At a low velocity of reaction, the curve for I_2^--ion formation agrees in its general appearance with that of Mohler. However, while in Mohler's curve the min. appears at 2 v.; here it is at 0.5 v. This curve has a pronounced max. (at 2–4 v.) with a slight dip in it; then the curve runs almost parallel to the abscissa and finally rises slightly, after passing the ionization potential. Electrons of 0 velocity, and at velocities corresponding to 2–4 v. attach themselves most readily to I_2 mols. The probability of formation of neg. ions of I_2 at low speeds of electrons, as calcd. from data obtained in these expts., is of the order of 10^{-6}. With A and Hg, at low speeds of electrons, neg. ions were not detected. At velocities near and above the ionization potentials, neg. ions of A and Hg are observed and the probability of their formation is also of the order of 10^{-6}.

S. L. MADORSKY

A50-5LA METALLURGICAL LITERATURE CLASSIFICATION

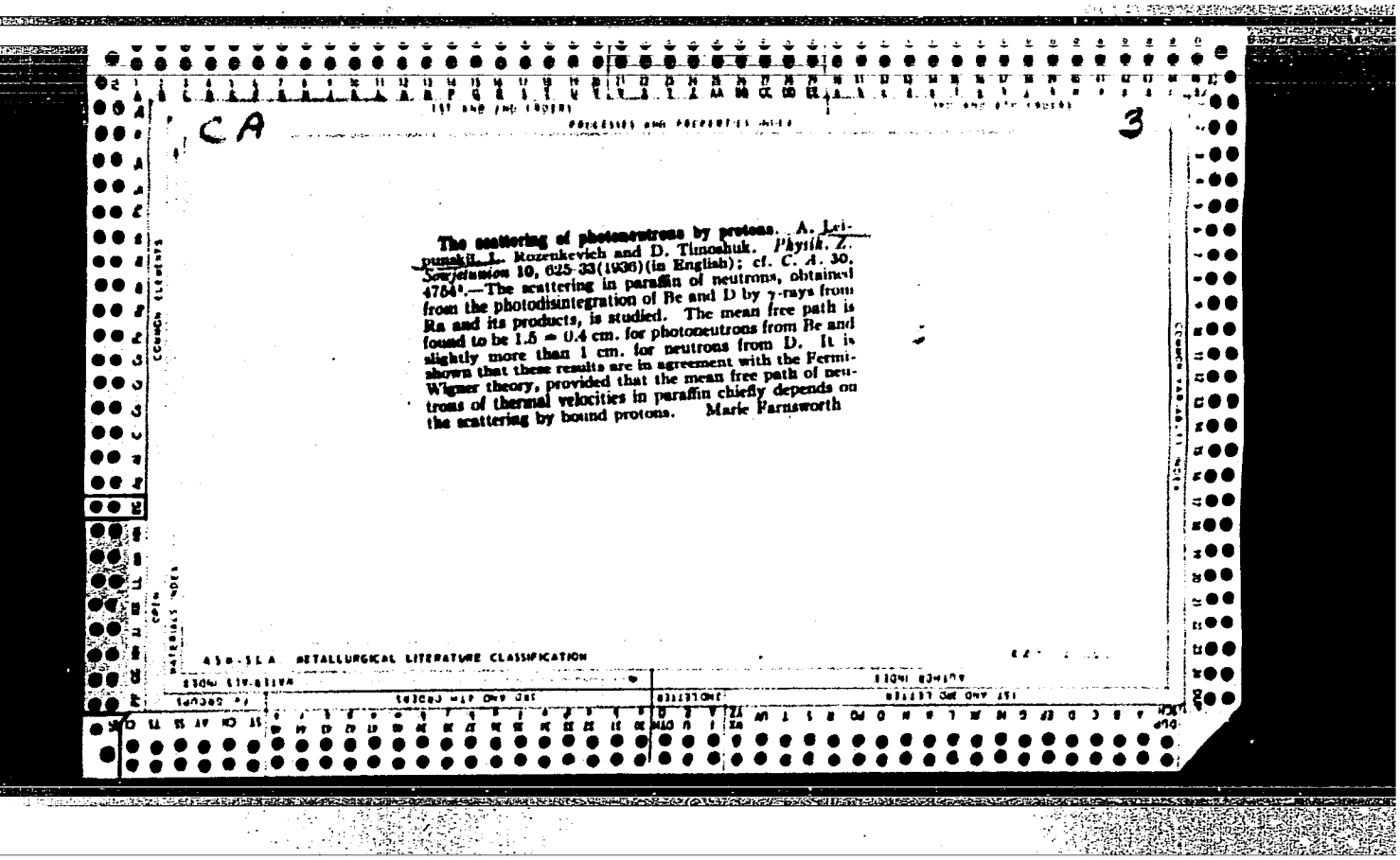


Absorption of slow neutrons at low temperatures. A. I. Leipunskiĭ (Bull. Acad. Sci. U.R.S.S., 1938, 627–631). The mean free path of neutrons in paraffin wax has been found to be 1·3±0·2 cm. for energy 180 kv. and 1±0·3 for energy 30 kv. Vals. are in agreement with theory. The absorption of group *C* neutrons in Ag and In has been measured at 290°, 77°, and 20·4° abs. The ratio of the thicknesses of equal absorbing layers at different temp. is const., but is < the theoretical val. O. D. B.

LEYPUNSKIY, A. I.

"On the Change in the Action of Photoneutrons on Silver in Passing Through a Layer of Copper, Lead, or Beryllium," Phys. Zeitschrift der Sow., No.9, pp. 275-78, 1936

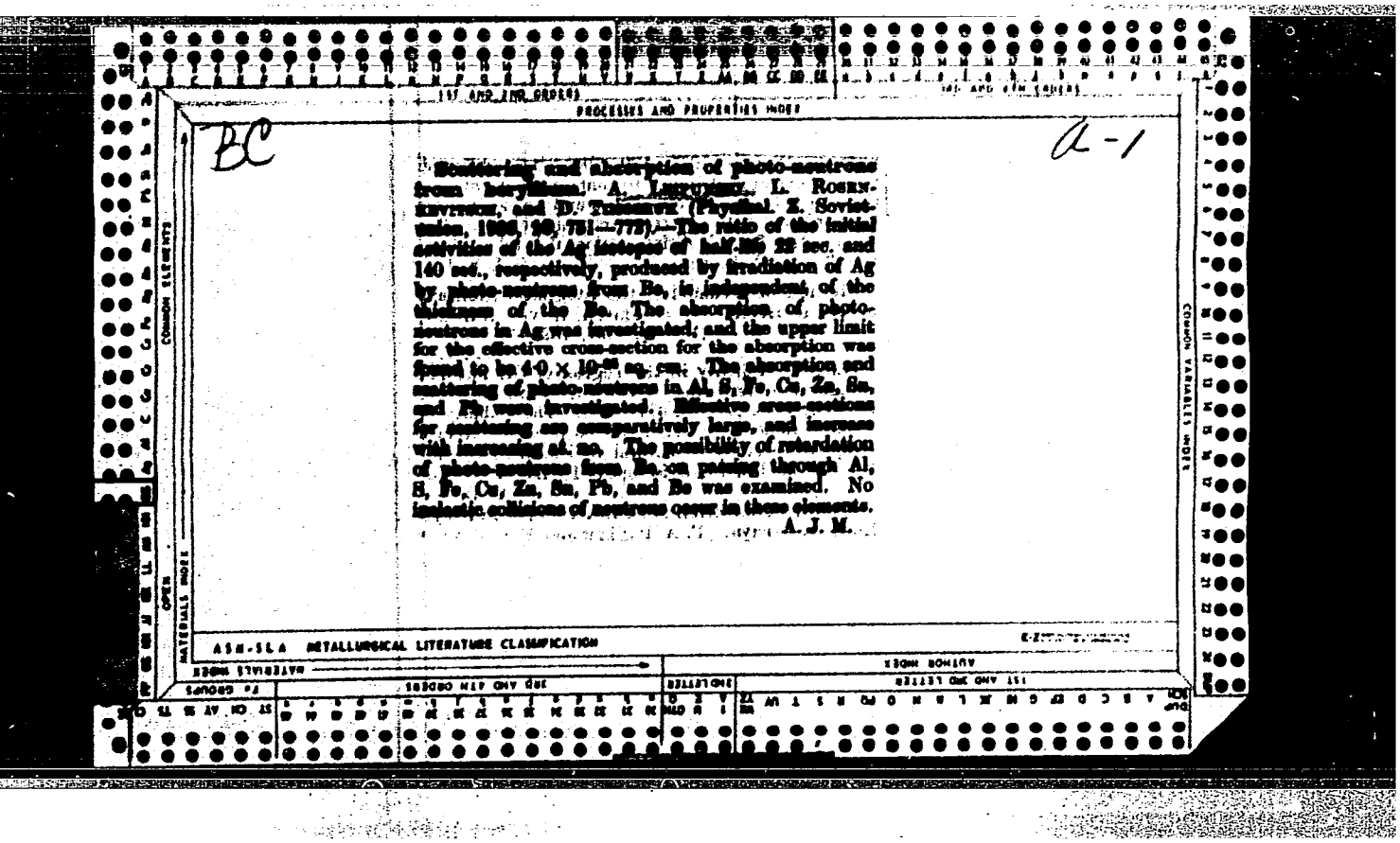
Ukrainian Phys. Tech. Inst., Khar'kov



CA 3

The scattering of photoneutrons by protons. A. Leipunskii, L. Rozenkevich and D. Timoshuk. *Physik. Z. Sowjetunion* 10, 625-33(1936)(in English); cf. *C. A.* 30, 4784⁵.—The scattering in paraffin of neutrons, obtained from the photodisintegration of Be and D by γ-rays from Ra and its products, is studied. The mean free path is found to be 1.5 ± 0.4 cm. for photoneutrons from Be and slightly more than 1 cm. for neutrons from D. It is shown that these results are in agreement with the Fermi-Wigner theory, provided that the mean free path of neutrons of thermal velocities in paraffin chiefly depends on the scattering by bound protons. Marie Farnsworth

A50-51A METALLURGICAL LITERATURE CLASSIFICATION



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Scattering and absorption of photo-neutrons from beryllium. A. Lapochkin, L. Rosenkevitch, and D. Tsikunov (Physical. Z. Soviet-union, 1936, 10, 781—772).—The ratio of the initial activities of the Ag isotopes of half-life 22 sec. and 140 sec., respectively, produced by irradiation of Ag by photo-neutrons from Be, is independent of the thickness of the Be. The absorption of photo-neutrons in Ag was investigated, and the upper limit for the effective cross-section for the absorption was found to be $4\cdot0 \times 10^{-28}$ sq. cm. The absorption and scattering of photo-neutrons in Al, S, Fe, Cu, Zn, Sn, and Pb were investigated. Effective cross-sections for scattering are comparatively large, and increase with increasing at. no. The possibility of retardation of photo-neutrons from Be on passing through Al, S, Fe, Cu, Zn, Sn, Pb, and Be was examined. No inelastic collisions of neutrons occur in these elements.

A. J. M.

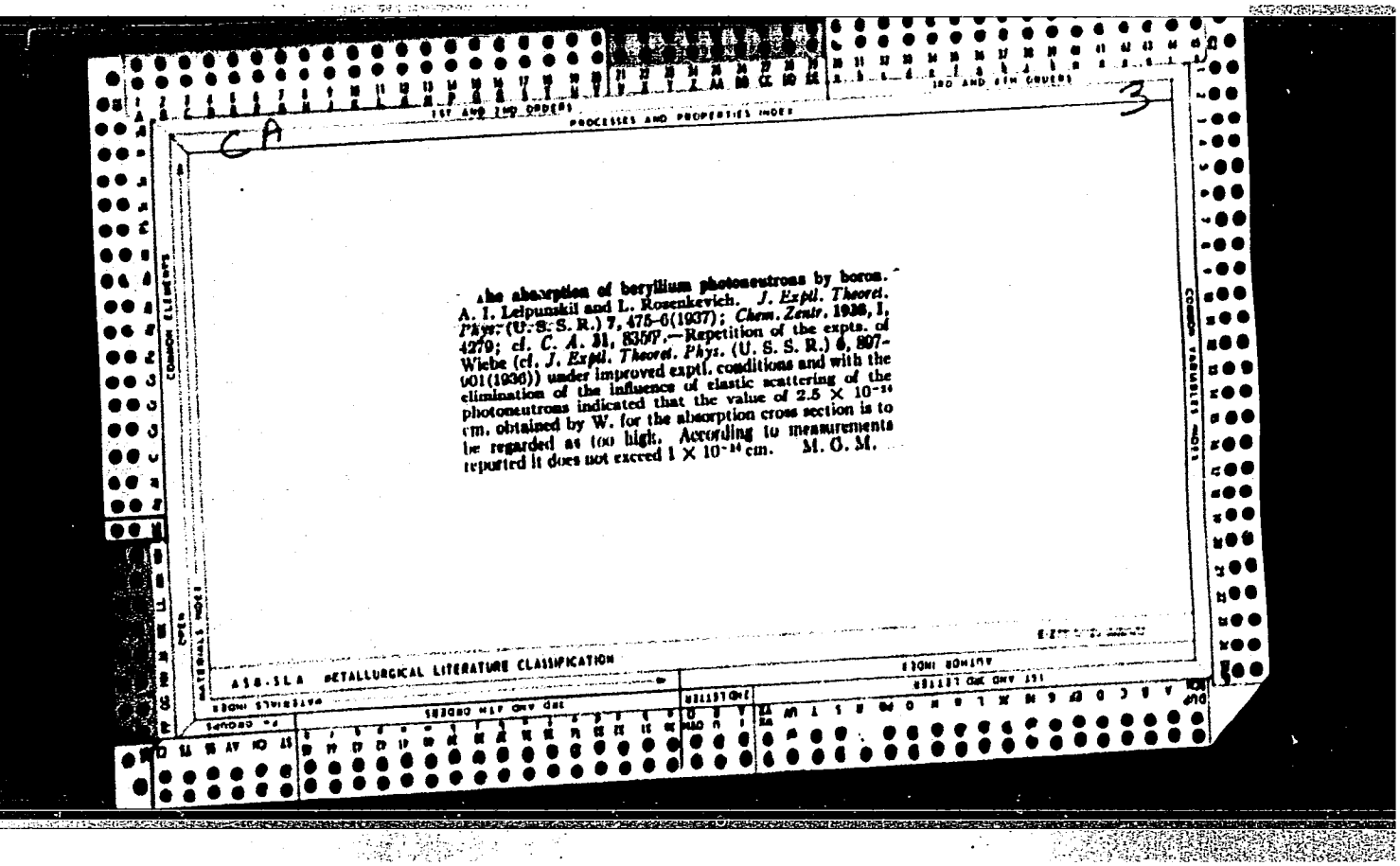
LEIPUNSKII, A. I.

Fomin, V.; Houtermans, F. G.; Leipunskii, A.I.; Ruzinov, L.P.; and Shubnikov, L.V.

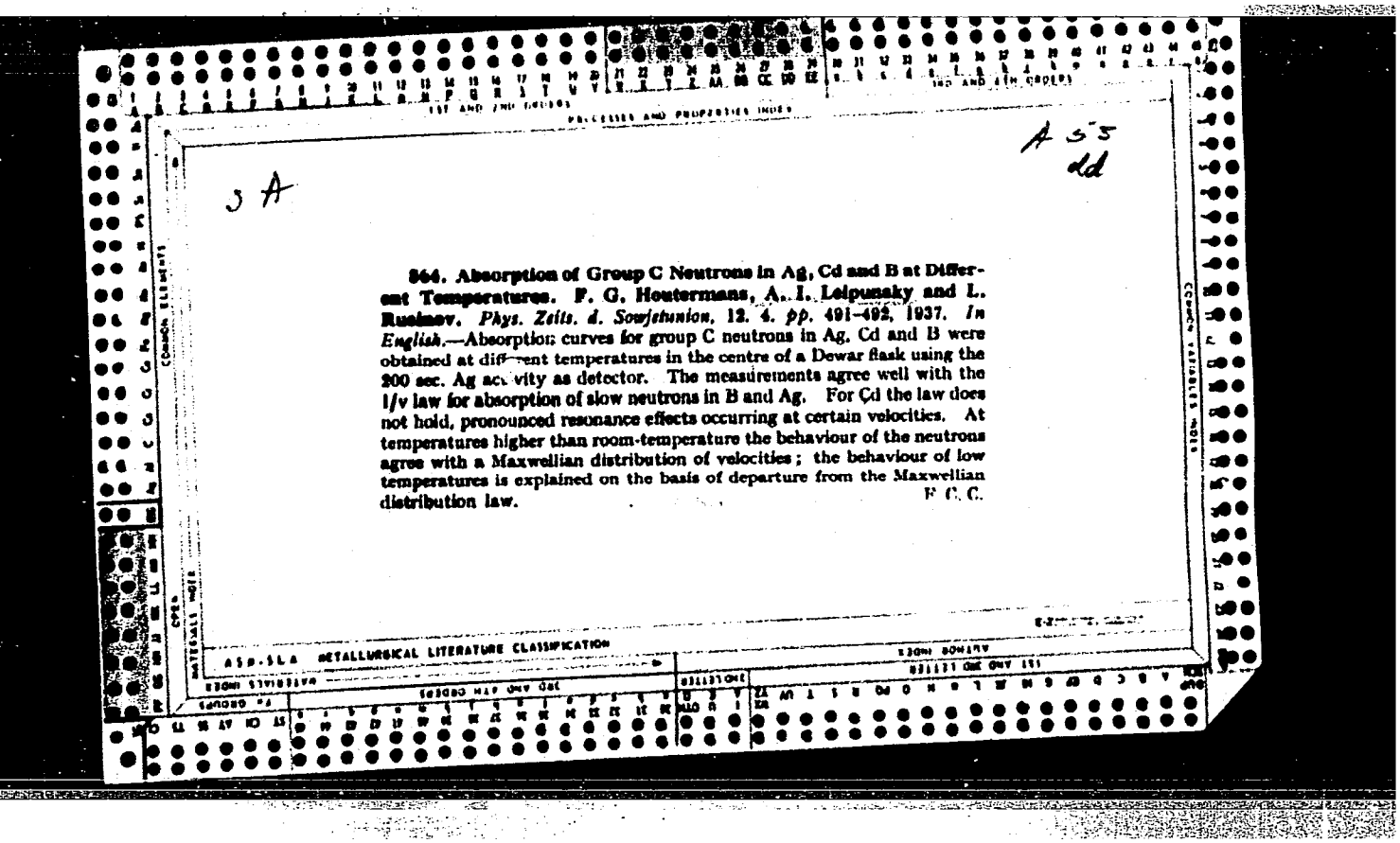
Neutron absorption by boron and cadmium at low temperatures.

Nature, Vol. 138, 1936, p. 505

Chem. Abs., Vol. 30, p. 8006-2



The absorption of beryllium photoneutrons by boron. A. I. Leipunskii and L. Rosenkevich. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 7, 475–6(1937); *Chem. Zentr.* 1938, I, 4270; cf. *C. A.* 31, 8350*f*.—Repetition of the expts. of Wiebe (cf. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 6, 807–901(1936)) under improved exptl. conditions and with the elimination of the influence of elastic scattering of the photoneutrons indicated that the value of 2.5×10^{-24} cm. obtained by W. for the absorption cross section is to be regarded as too high. According to measurements reported it does not exceed 1×10^{-24} cm. M. G. M.



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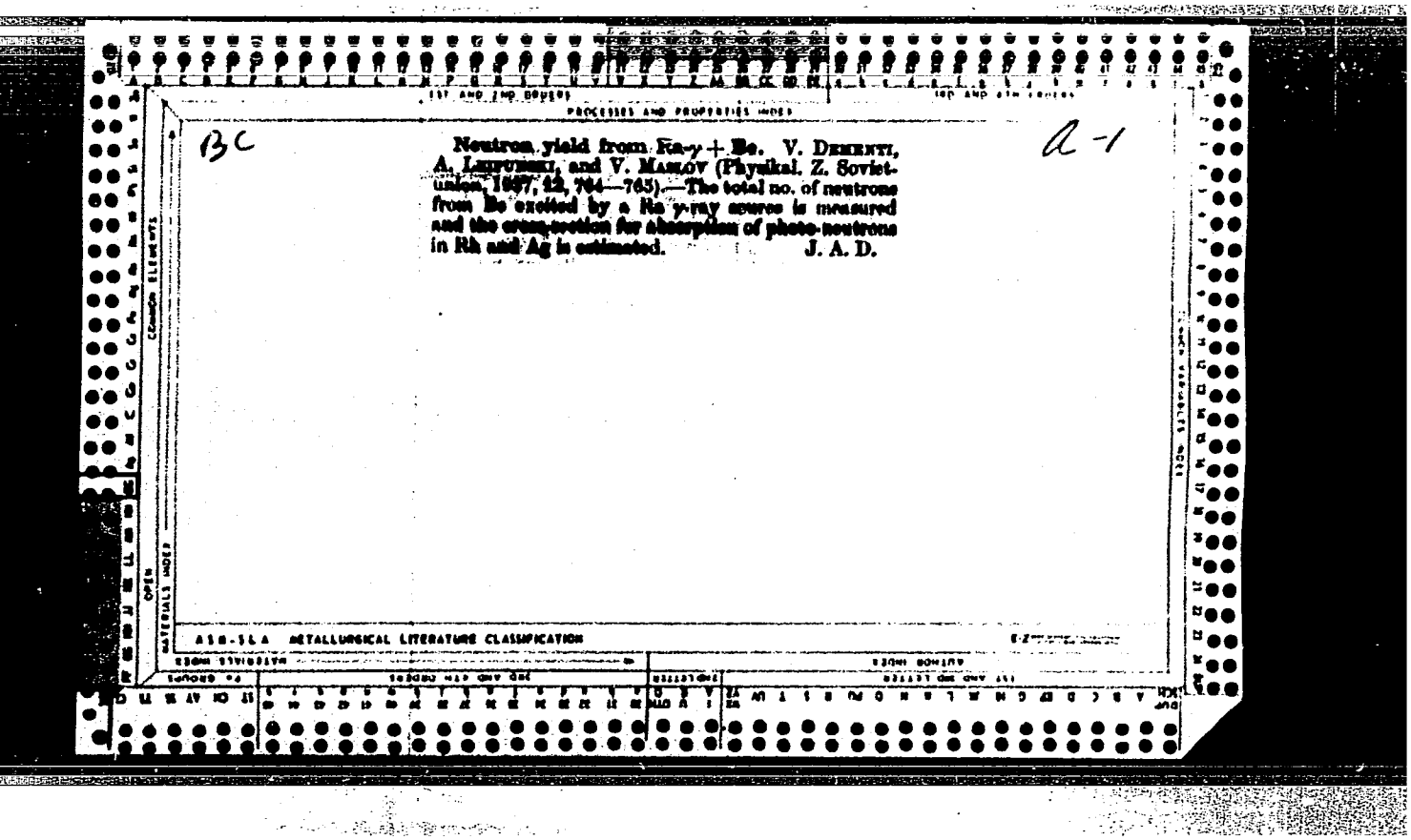
864. Absorption of Group C Neutrons in Ag, Cd and B at Different Temperatures. F. G. Houtermans, A. I. Leipunsky and L. Rusinov. *Phys. Zeits. d. Sowjetunion*, 12. 4. *pp.* 491–492, 1937. *In English.*—Absorption curves for group C neutrons in Ag, Cd and B were obtained at different temperatures in the centre of a Dewar flask using the 200 sec. Ag activity as detector. The measurements agree well with the 1/v law for absorption of slow neutrons in B and Ag. For Cd the law does not hold, pronounced resonance effects occurring at certain velocities. At temperatures higher than room-temperature the behaviour of the neutrons agree with a Maxwellian distribution of velocities; the behaviour of low temperatures is explained on the basis of departure from the Maxwellian distribution law.

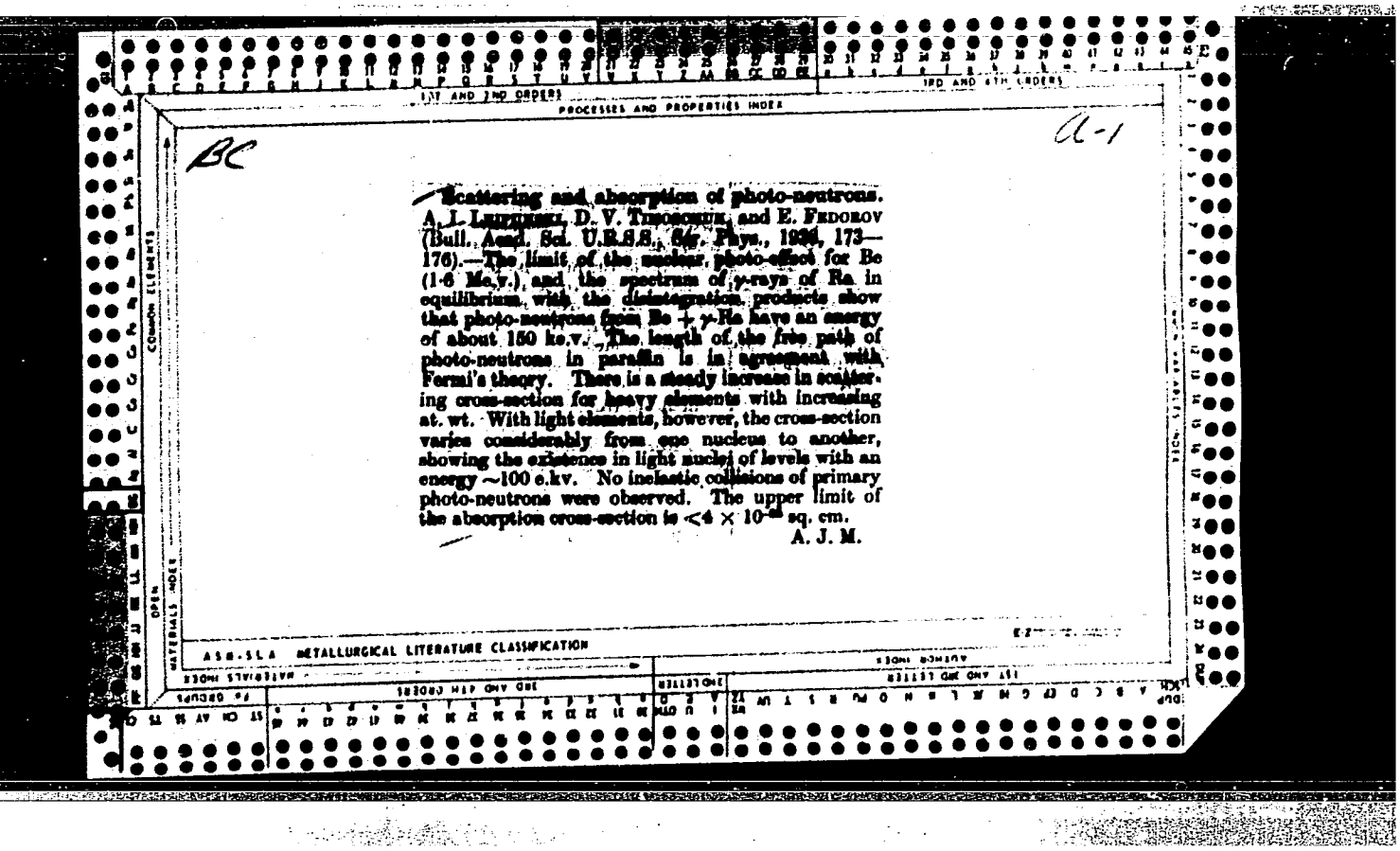
F. C. C.



BC

Neutron yield from Ra-γ + Be. V. DEMENTI, A. LEPUSHKI, and V. MASLOV (Physikal. Z. Sovietunion, 1937, 12, 764—765).—The total no. of neutrons from Be excited by a Ra γ-ray source is measured and the cross-section for absorption of photo-neutrons in Rh and Ag is estimated. J. A. D.

A-1



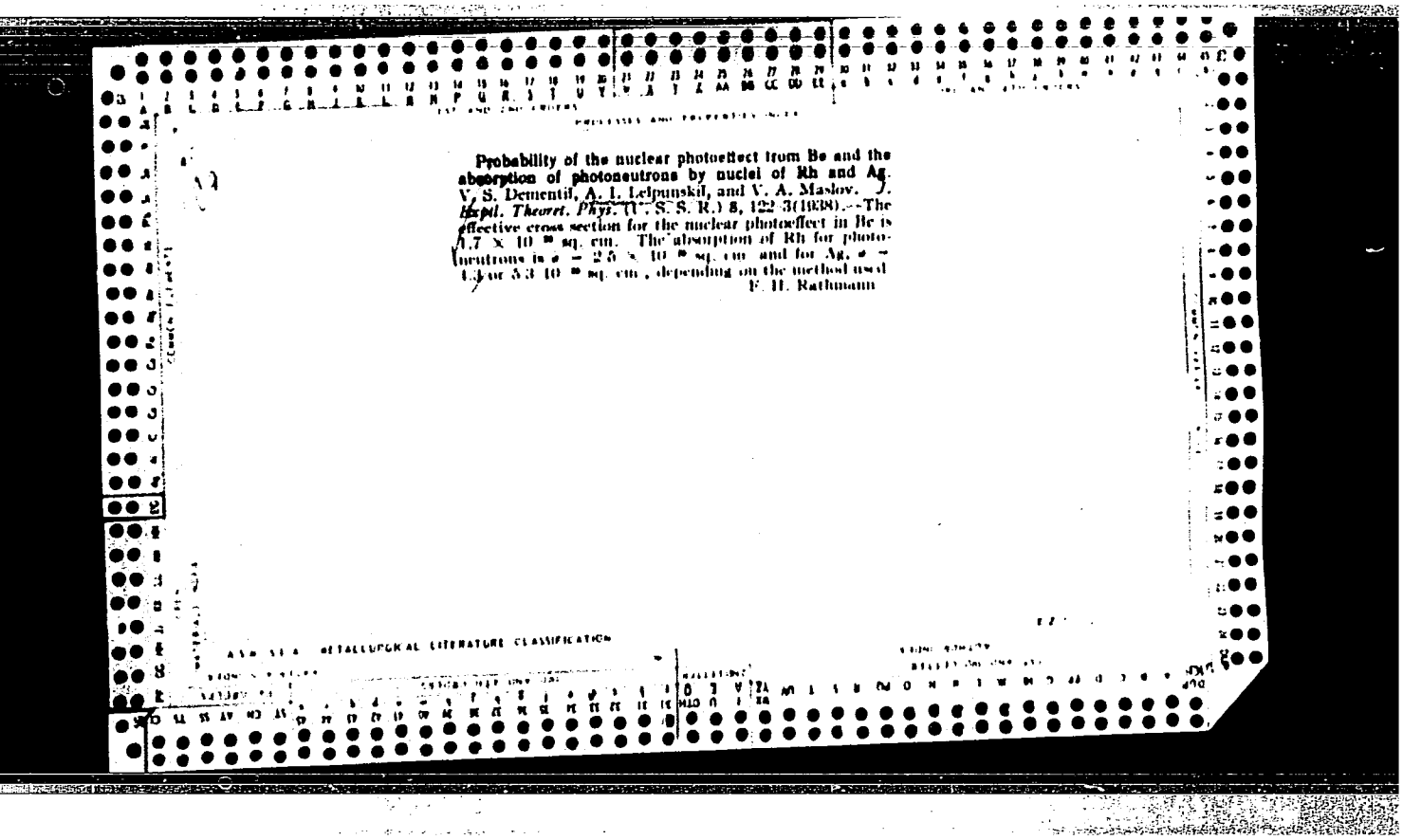
BC

A-1

Scattering and absorption of photo-neutrons. A. I. Leipunski, D. V. Timoschuk, and E. Fedorov (Bull. Acad. Sci. U.R.S.S., Sér. Phys., 1936, 173—176).—The limit of the nuclear photo-effect for Be (1·6 Me.v.) and the spectrum of γ-rays of Ra in equilibrium with the disintegration products show that photo-neutrons from Be + γ-Ra have an energy of about 150 ke.v. The length of the free path of photo-neutrons in paraffin is in agreement with Fermi's theory. There is a steady increase in scattering cross-section for heavy elements with increasing at. wt. With light elements, however, the cross-section varies considerably from one nucleus to another, showing the existence in light nuclei of levels with an energy ~100 e.kv. No inelastic collisions of primary photo-neutrons were observed. The upper limit of the absorption cross-section is $<4 \times 10^{-26}$ sq. cm.

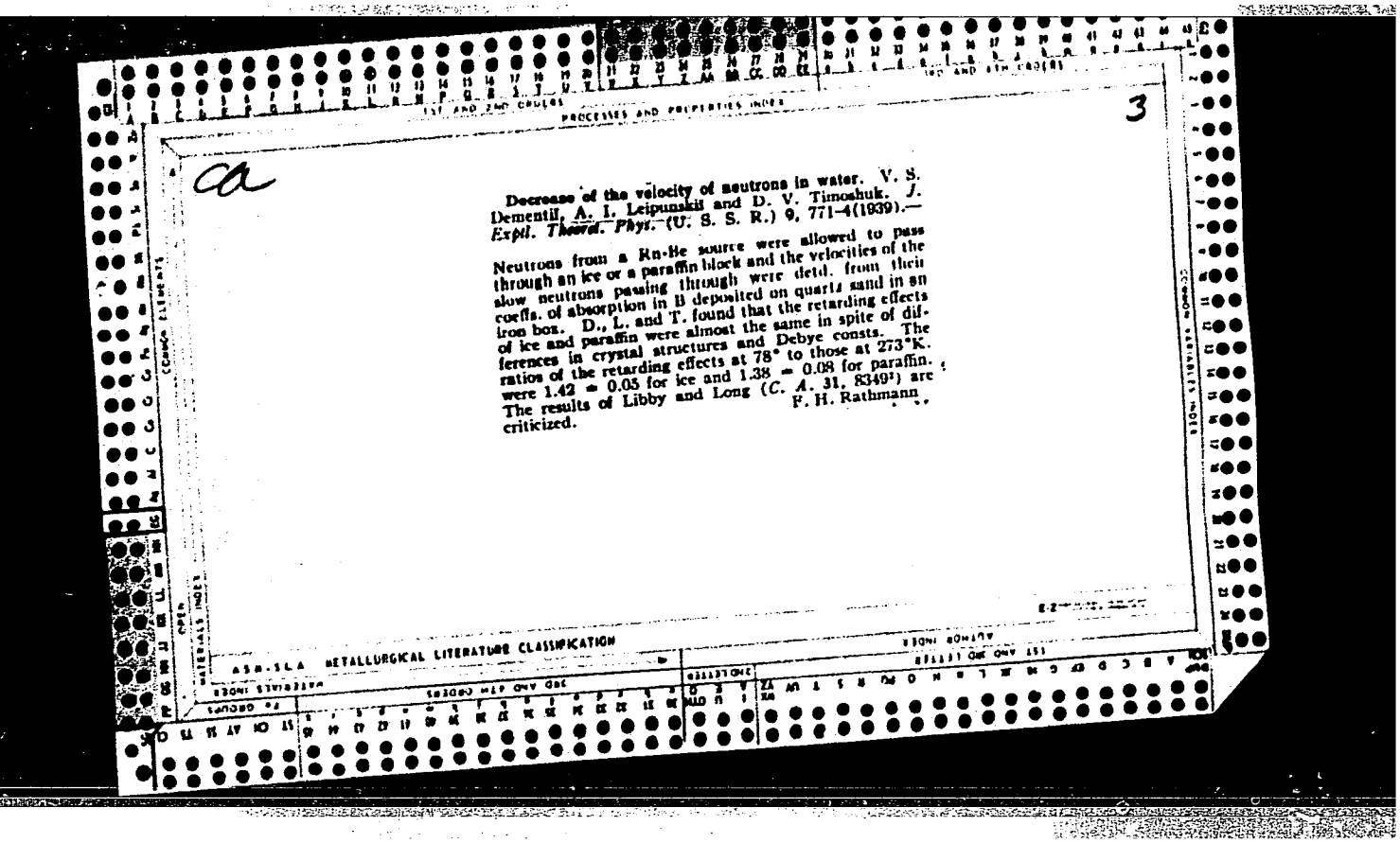
A. J. M.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Probability of the nuclear photoeffect from Be and the absorption of photoneutrons by nuclei of Rh and Ag. V. S. Dementif, A. I. Leipunskif, and V. A. Maslov. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 8, 122-3(1938).--The effective cross section for the nuclear photoeffect in Be is 1.7 × 10 [illegible] sq. cm. The absorption of Rh for photoneutrons is σ = 2.5 × 10 [illegible] sq. cm and for Ag, σ = 1.3 or 5.3 10 [illegible] sq. cm., depending on the method used. F. H. Rathmann

METALLURGICAL LITERATURE CLASSIFICATION



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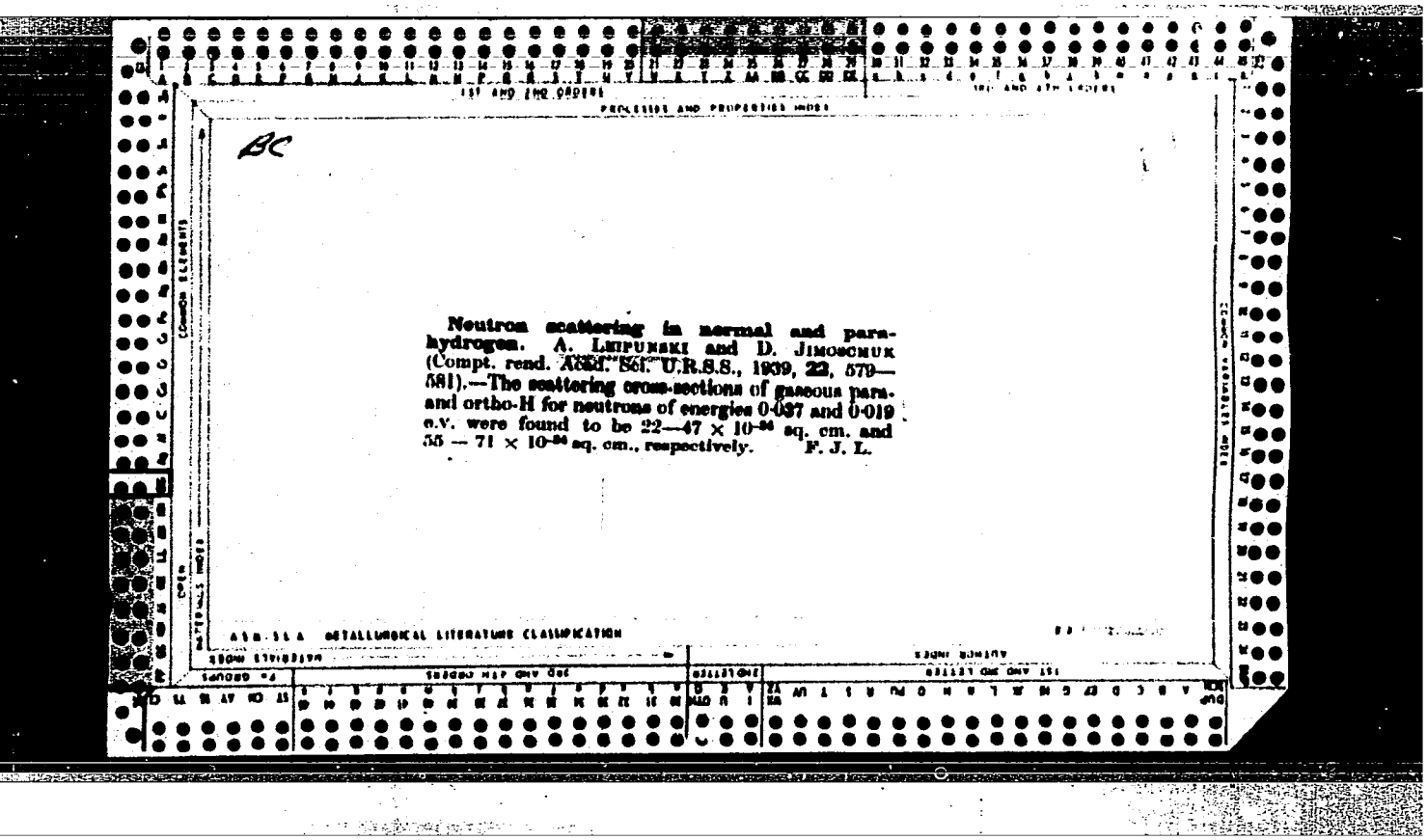
aa

Decrease of the velocity of neutrons in water. V. S. Dementiĭ, A. I. Leipunskiĭ and D. V. Timoshuk. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 9, 771–4(1939).—

Neutrons from a Rn-Be source were allowed to pass through an ice or a paraffin block and the velocities of the slow neutrons passing through were detd. from their coeffs. of absorption in B deposited on quartz sand in an iron box. D., L. and T. found that the retarding effects of ice and paraffin were almost the same in spite of differences in crystal structures and Debye consts. The ratios of the retarding effects at 78° to those at 273°K. were 1.42 ± 0.05 for ice and 1.38 ± 0.08 for paraffin. The results of Libby and Long (*C. A.* 31, 8349²) are criticized.

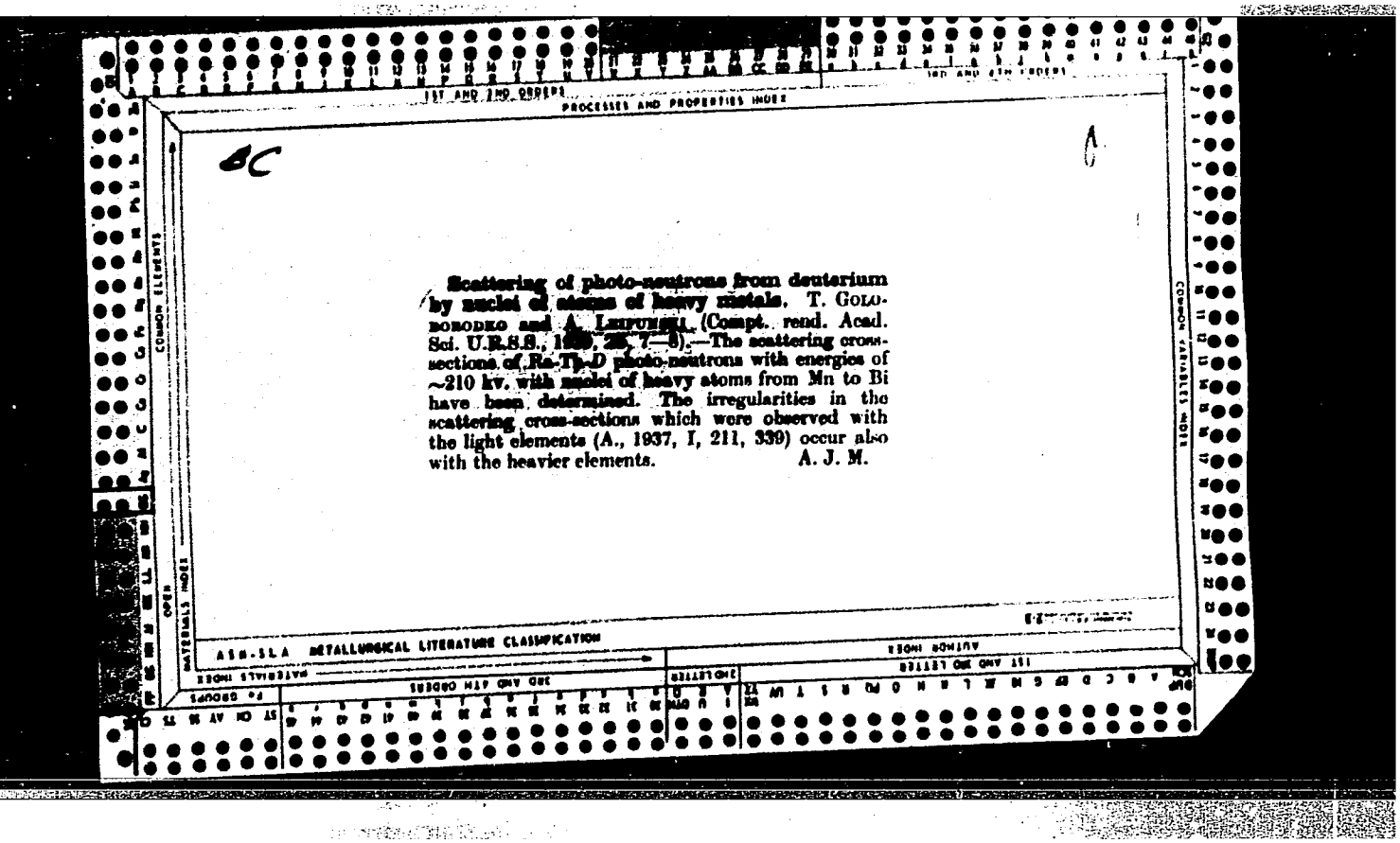
F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



BC

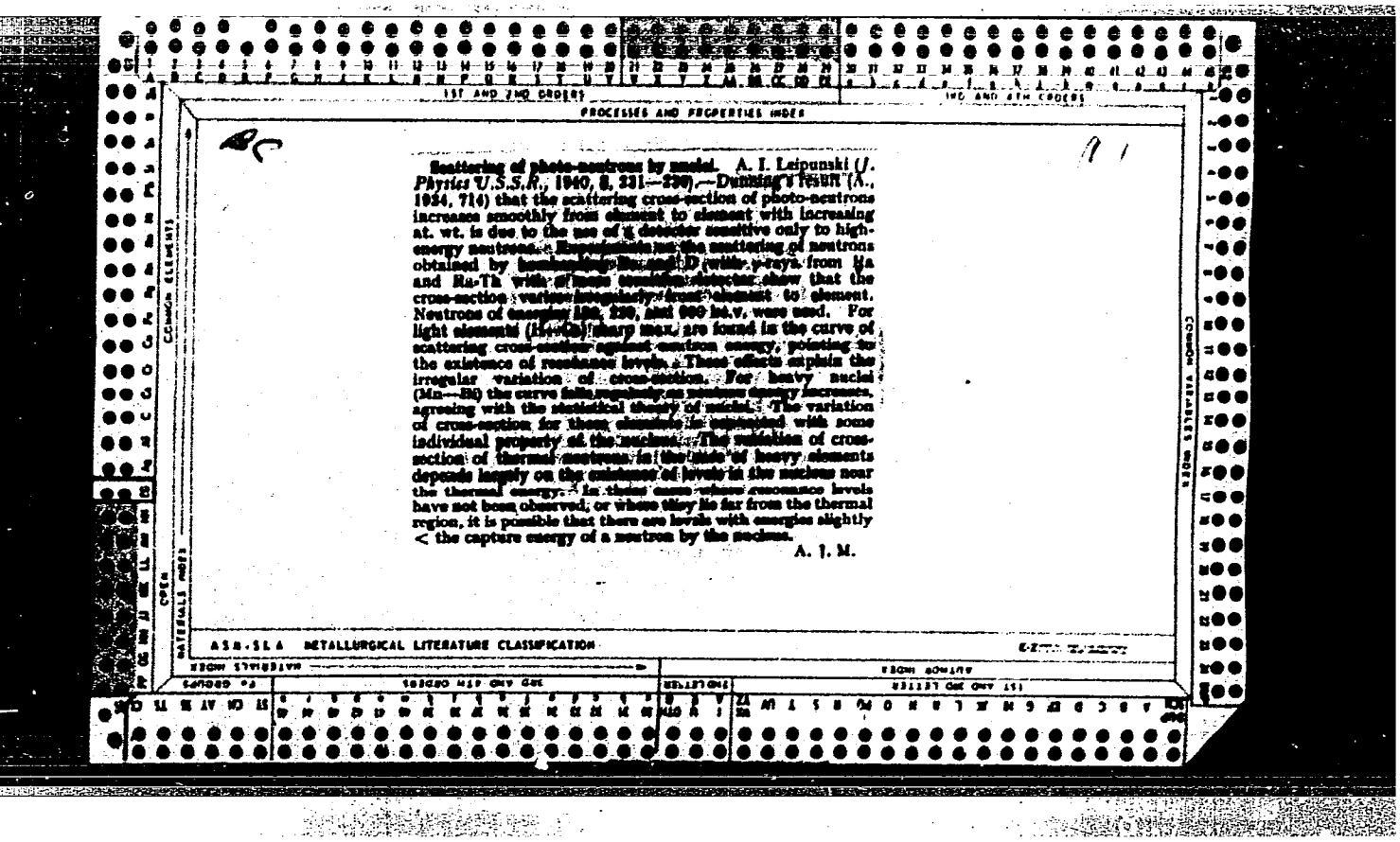
Neutron scattering in normal and para-hydrogen. A. LEIPUNSKI and D. JIMOSCHUK (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 579—581).—The scattering cross-sections of gaseous para- and ortho-H for neutrons of energies 0·037 and 0·019 e.v. were found to be 22—47 $\times$ 10^{-24} sq. cm. and 55 — 71 $\times$ 10^{-24} sq. cm., respectively. F. J. L.



Scattering of photo-neutrons from deuterium by nuclei of atoms of heavy metals. T. GOLODORODKO and A. LEIPUNSKI. (Compt. rend. Acad. Sci. U.R.S.S., 1938, 20, 7—8).—The scattering cross-sections of Ra-Th-*D* photo-neutrons with energies of ~210 kv. with nuclei of heavy atoms from Mn to Bi have been determined. The irregularities in the scattering cross-sections which were observed with the light elements (A., 1937, I, 211, 339) occur also with the heavier elements. A. J. M.

m LEYPUNSKIY, A.leksandr Il'ich and GOLOBOROD'KO, T. A.

"The Emission of Photoneutrons of Various Degrees of Energy by Atomic Nuclei," Iz. Ak. Nauk SSSR, Fiz. Ser., No.2, 1940

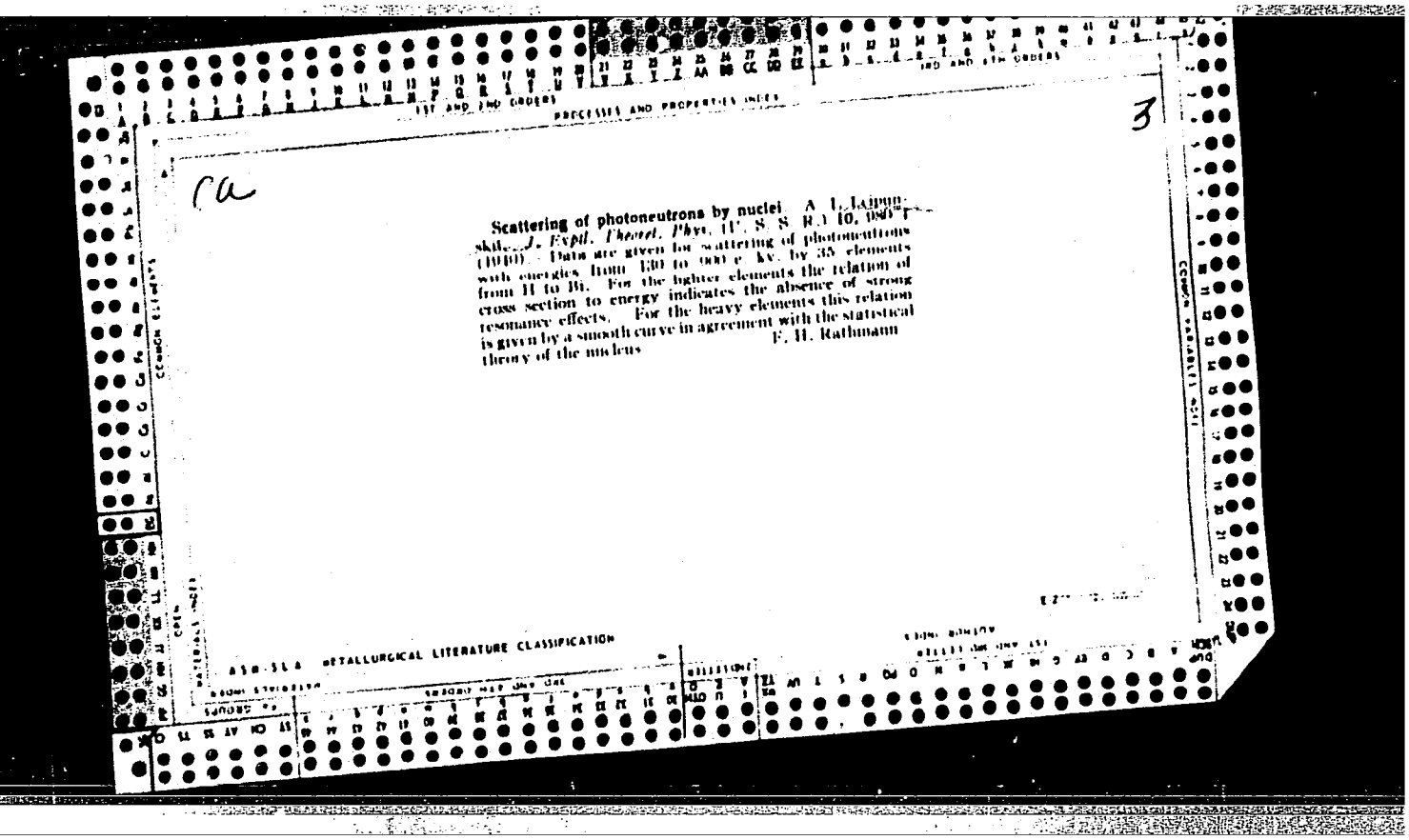


PROCESSES AND PROPERTIES INDEX

Scattering of photo-neutrons by nuclei. A. I. Leipunski (*J. Physics U.S.S.R.*, 1940, **3**, 231—239).—Dunning's result (*A.*, 1934, 714) that the scattering cross-section of photo-neutrons increases smoothly from element to element with increasing at. wt. is due to the use of a detector sensitive only to high-energy neutrons. Experiments on the scattering of neutrons obtained by bombarding Be and D (with γ-rays from Ra and Ra-Th with a boron counter detector show that the cross-section varies irregularly from element to element. Neutrons of energies 150, 220, and 900 kv. were used. For light elements (Li—Ca) sharp max. are found in the curve of scattering cross-section against neutron energy, pointing to the existence of resonance levels. These effects explain the irregular variation of cross-section. For heavy nuclei (Mn—Bi) the curve falls regularly as neutron energy increases, agreeing with the statistical theory of nuclei. The variation of cross-section for these elements is connected with some individual property of the nucleus. The variation of cross-section of thermal neutrons in the case of heavy elements depends largely on the existence of levels in the nucleus near the thermal energy. In those cases where resonance levels have not been observed, or where they lie far from the thermal region, it is possible that there are levels with energies slightly < the capture energy of a neutron by the nucleus.

A. J. M.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

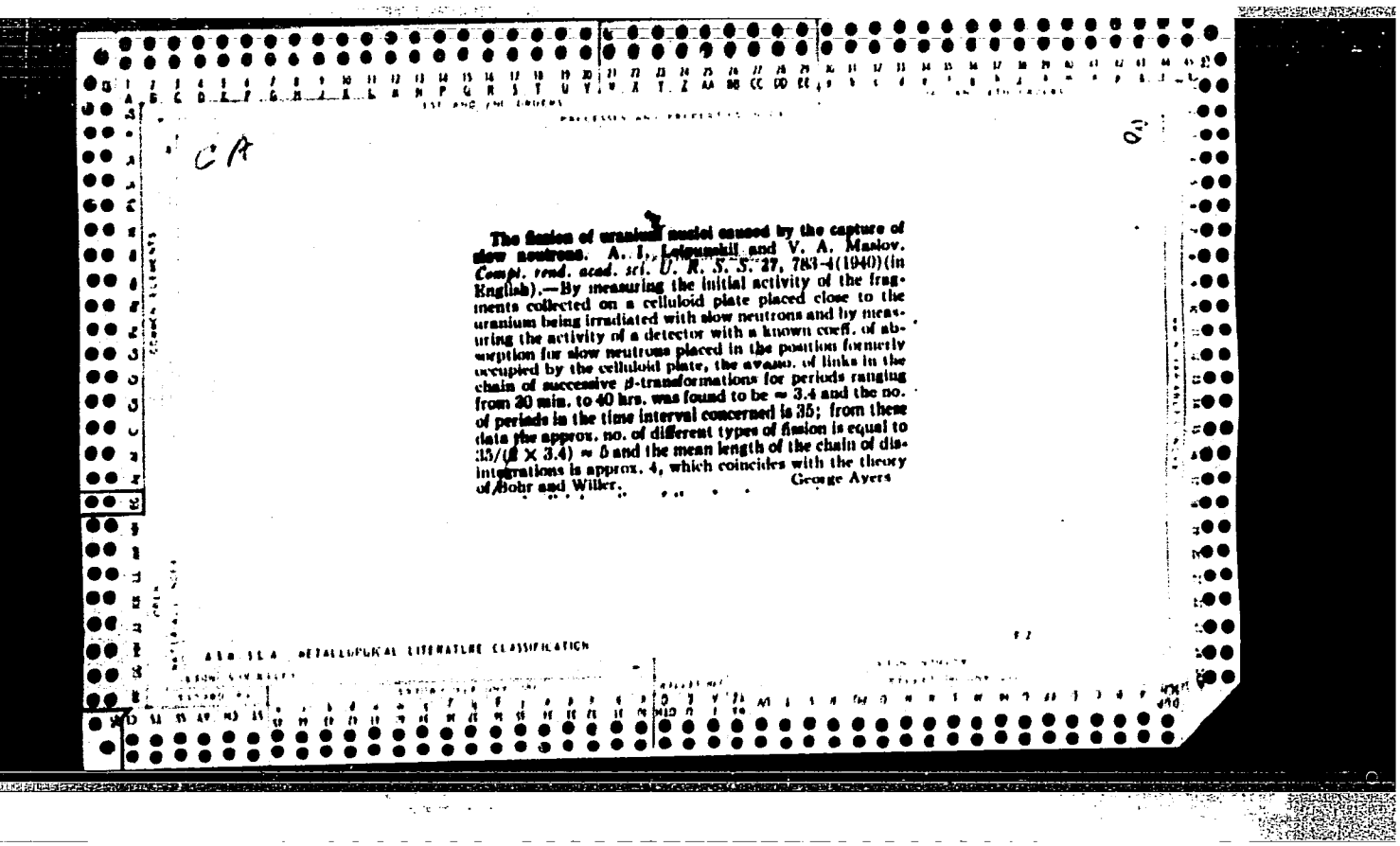


Ca

3

Scattering of photoneutrons by nuclei. A. I. Lajpun-skii. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 980-1 (1940). Data are given for scattering of photoneutrons with energies from 130 to 900 ± kv. by 35 elements from H to Bi. For the lighter elements the relation of cross section to energy indicates the absence of strong resonance effects. For the heavy elements this relation is given by a smooth curve in agreement with the statistical theory of the nucleus. F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

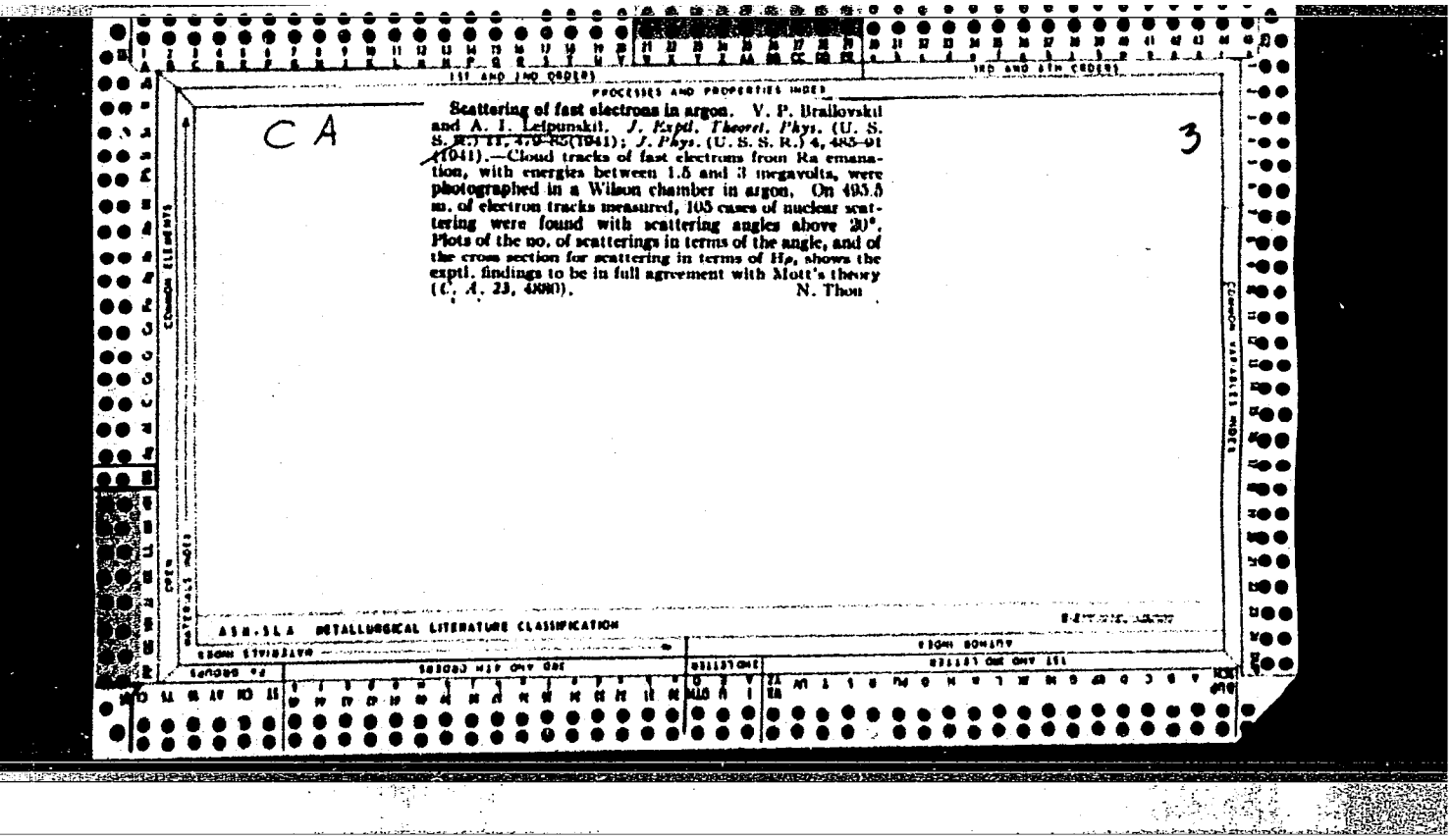


CA

The fission of uranium nuclei caused by the capture of slow neutrons. A. I. Leipunskii and V. A. Maslov. *Compt. rend. acad. sci. U. R. S. S.* 27, 783-4(1940)(in English).—By measuring the initial activity of the fragments collected on a celluloid plate placed close to the uranium being irradiated with slow neutrons and by measuring the activity of a detector with a known coeff. of absorption for slow neutrons placed in the position formerly occupied by the celluloid plate, the average no. of links in the chain of successive β-transformations for periods ranging from 20 min. to 40 hrs. was found to be ≈ 3.4 and the no. of periods in the time interval concerned is 35; from these data the approx. no. of different types of fission is equal to 35/(8 × 3.4) ≈ 5 and the mean length of the chain of disintegrations is approx. 4, which coincides with the theory of Bohr and Willer.

George Ayers

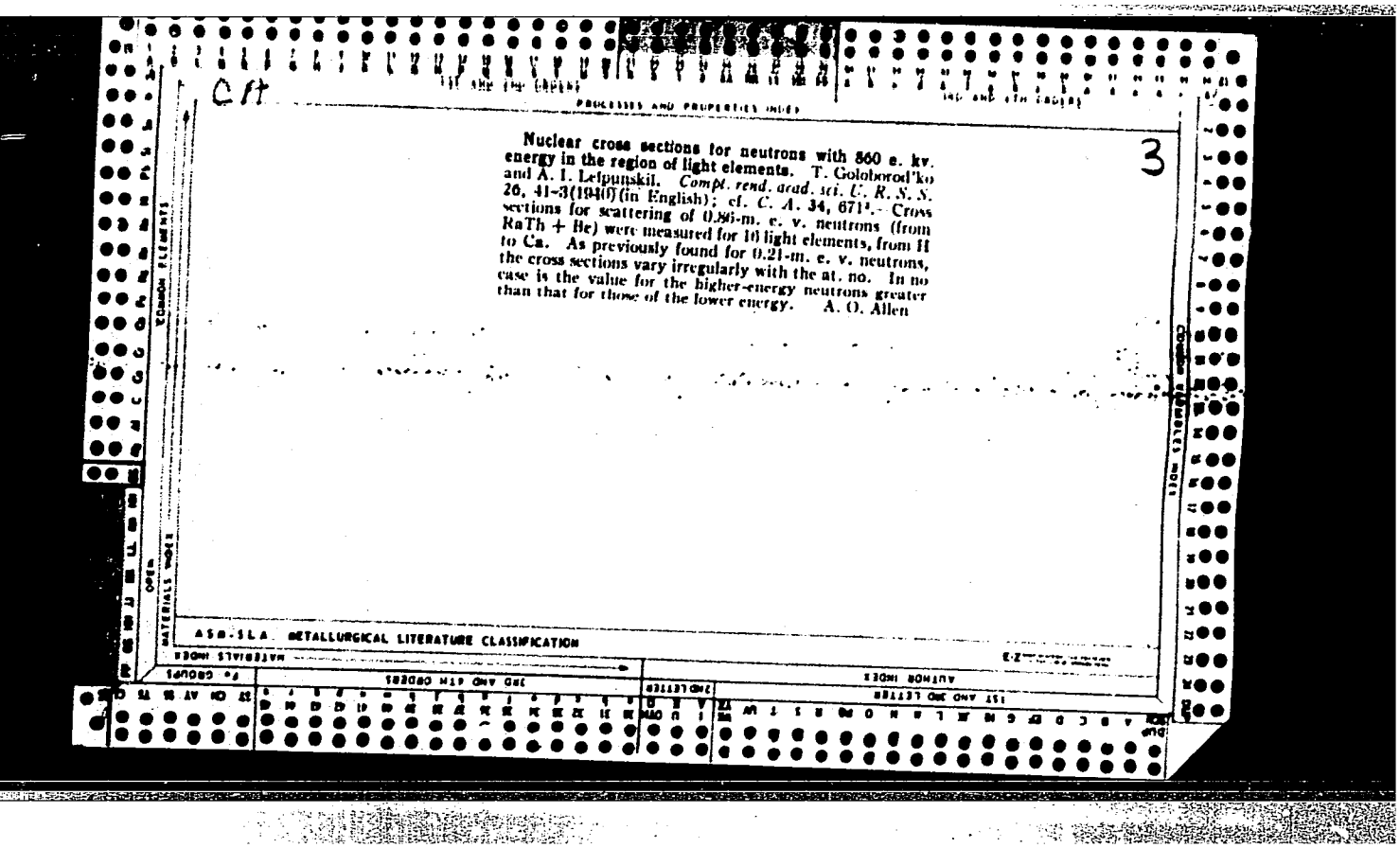
ASM SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

3

Scattering of fast electrons in argon. V. P. Bralovskii and A. I. Leipunskii. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 11, 479–85(1941); *J. Phys.* (U. S. S. R.) 4, 483–91 (1941).—Cloud tracks of fast electrons from Ra emanation, with energies between 1.5 and 3 megavolts, were photographed in a Wilson chamber in argon. On 493.5 m. of electron tracks measured, 105 cases of nuclear scattering were found with scattering angles above 30°. Plots of the no. of scatterings in terms of the angle, and of the cross section for scattering in terms of $H\rho$, shows the exptl. findings to be in full agreement with Mott's theory (C. A. 23, 4980). N. Thon



Cft

PROCESSES AND PROPERTIES INDEX

3

Nuclear cross sections for neutrons with 860 e. kv. energy in the region of light elements. T. Goloborod'ko and A. I. Lelpunskil. *Compt. rend. acad. sci. U. R. S. S.* 26, 41-3(1940)(in English); cf. *C. A.* 34, 671⁴.—Cross sections for scattering of 0.86-m. e. v. neutrons (from RaTh + Be) were measured for 10 light elements, from H to Ca. As previously found for 0.21-m. e. v. neutrons, the cross sections vary irregularly with the at. no. In no case is the value for the higher-energy neutrons greater than that for those of the lower energy. A. O. Allen

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LEYPUNSKIY, A.I.

Nuclear scattering cross-sections for heavy elements with photo-neutrons of about 200 ke.v. T. A. Goloborodko and A. I. Leipunski (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 708—709).—The σ_n are given for various elements as far as Bi for photoneutrons from RaTh–D (~200 ke.v.) and RaTh–Be (~800 ke.v.). These results are compared with those of Amaldi using neutrons from (C–D) of supposedly 100—200 ke.v. There is considerable agreement, but it is concluded that Amaldi's neutron spectrum was other than he believed. H. V. S.-R.

89-6-1/24

AUTHOR: LEYPUNSKIY, A.I., BLOKHINTSEV, D.I., ARISTARKHOV, I.N., BONDARENKO, I.I., KAZACHKOVSKIY, O.D., PINKHASIK, M.S., STAVISSKIY, Yu.Ya., STUMBUR, E.A., UKRAINTSEV, F.I., USACHEV, L.N.

TITLE: The Experimental Reactor for Fast Neutrons BP - 2. (Eksperimental'nyy reaktor na bystrykh neytronakh BP-2-Russian)

PERIODICAL: Atomnaya Energiya, 1957, Vol 2, Nr 6, pp 497-500 (U.S.S.R.)

ABSTRACT: This reactor is intended to be used for physical investigations with fast neutrons. At first the active zone of the reactor is discussed. The heat-separating elements of the reactor BP-2 consist of plutonium rods of 10 mm diameter and 130 mm length. Besides the plutonium rods there are similarly constructed rods in the active zone which are made of poor uranium. Altogether there are 108 uranium- and plutonium rods which are mounted in a steel tube with an inner diameter of 130 mm. The reflector of the reactor consists of an uranium layer (outer diameter 700 mm) and a coper layer (outer diameter 1000 mm). The reactor is controlled by a control system and by an emergency system. The operating control organs are part of a screen which are located near the active zone. The control system also contains boron-ionization chambers, an electronic apparatus, and servofeeds. The emergency system enters into operation if the prescribed or assumed power of the reactor is exceeded. Circulating mercury is used for the system of heat conduction. This mercury is cooled in a heat exchanger with water. The radiation protection of the reactor consists of the following parts: a) a water layer of 300 mm thickness b) a cast iron layer of 400 mm

Card 1/2

Lejpunskij, A.I.

CZECHOSLOVAKIA/Nuclear Physics - Nuclear Power and Technology C-8

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 10308

Author : Lejpunskij, A.I., Blochincev, D.I., Aristarchov, I.N., Bondarenko, I.I., Kazackovskiy, O.P., Pinchasik, M.S., Stavissky, Ju.Ja., Stumbur, E.A., Ukrajincev, F.I., Usacev, L.N.

Inst : Not Given

Title : Soviet Experimental Fast Neutron Reactor BR-2.

Orig Pub : Jaderna energie, 1957, 3, No 8, 231-233

Abstract : Translation from the Russian. See Referat Zhur Fizika, 1958, No 1, 597

Card : 1/1

LEYPUNSKIY, A. I. et al.

"Research on Fast Reactor Physics."

paper to be presented at 2nd UN Intl." Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sept 58.

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000929720(

LEYPUNSKIY, A. I., KAZACHKOVSKIY, O. D., ARTUKHOV, G. A., BELANOVA, T. S, BARISHNIKOV, A. I., GALKOV, V. I., STAVISKIY, Yu. Y., STUMBUR, E. A. and SHERMAN, L. Ye.

"Effective Cross-Section Measurements, of Fast Neutron Radiation Capture."

paper to be presented at 2nd UN Intl.' Conf. on the peaceful use of Atomic Energy, Geneva, 1 - 13 Sept 58.

SOV/89-5-3-6/15

AUTHORS: Leypunskiy, A. I., Abramov, A. I., Andreyev, V. N., Baryshnikov, A. I., Bondarenko, I. I., Galkov, V. I., Golubev, V. I., Gul'ko, A. D., Guseynov, A. G., Kazachkovskiy, O. D., Kozlova, N. V., Krasnoyarov, N. V., Kuz'minov, B. D., Morozov, V. N., Nikolayev, M. N., Smirenkin, G. N., Stavisskiy, Yu. Ya., Ukraintsev, F. I., Usachev, L. N., Fetisov, N. I., Sherman, L. Ye.

TITLE: Investigations of the Physics of Reactors With Fast Neutrons. I (Issledovaniya po fizike reaktorov na bystrykh neytronakh)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 3, pp. 277-287 (USSR)

ABSTRACT: Since 1950 experiments have been carried out with fast reactors by the Main Administration of the Use of Nuclear Energy. At the Physics Institute of this organization the fast-neutron reactor BR-1 was put into operation early in 1955, and the reactors BR-2 and BR-3 followed in 1956 and 1957 respectively.

Reactor BR-1:

Power	50 MW
Active zone	diameter and height ~15 cm
Fuel	plutonium diameter ~1 cm
Canning	thin steel tube

Card 1/4

Investigations of the Physics of Reactors With Fast Neutrons.II

of 8 cm thickness. The uranium-water lattice consists of cylindrical slugs of normal uranium, which have a diameter of 35 mm. The canning material is aluminum. The ratio between water and uranium is 0,35. The lattice spacing is 40 mm. Measurements carried out with the water-uranium lattice instead of with the pure uranium layer showed:

1) The conversion factor is reduced from 2,45 ± 0,10 to 1,7 ± 0,2.
2) In the case of a fixed power output of the active zone the velocity with which the total quantity of plutonium 239 and uranium 235 is formed was increased by 35%.
3) The velocity with which plutonium is produced increased by 1,8 times its amount.
4) In the case of a fixed power output of the active zone the total power output of the reactor is increased by 2,2 times its amount.

Reactor BR-2:

This reactor was described more in detail in references 12 and 13. Its nominal power output is 120 kW, the maximum output is 200 kW. In the active zone of the reactor BP-2, which consists of plutonium rods, mercury is used as a coolant, which takes up

Investigations of the Physics of Reactors With Fast Neutrons-I

The Distribution of Neutrons in Uranium

The cross sections of the various reactions for the equilibrium spectrum and for the asymptotic spectrum of the depleted uranium was determined both theoretically and experimentally. The asymptotic length of diffusion determined experimentally and theoretically amounts to 9,1 ± 0,1 cm. The average number of fissions of uranium 238 caused by fission neutrons amounts to 0,17 ± 0,01. This is in agreement with the data given by reference 10.

Furthermore, the influence exercised by the resonance structure of the cross sections upon the spatial distribution of the neutrons is investigated. Kh. D. Mishchenko showed that for neutrons with 24 keV the total cross section for copper is reduced by about three times its amount with a modification of target thickness of from 0,5 to 30 mm. There are 12 figures, 7 tables, and 13 references, 9 of which are Soviet.

(Continued on abstract 7/15)

SOV/89-5-3-7/15

AUTHORS: Leypunskiy, A. I., Abramov, A. I., Andreyev, V. N., Baryshnikov, A. I., Bondarenko, I. I., Galkov, V. I., Golubev, V. I., Gul'ko, A. D., Guseynov, A. G., Kazachkovskiy, O. D., Kozlova, N. V., Krasnoyarov, N. V., Kuz'minov, B. D., Morozov, V. N., Nikolayev, M. N., Smirenkin, G. N., Stavisskiy, Yu. Ya., Ukraintsev, F. I., Usachev, L. N., Fetisov, N. I., Sherman, L. Ye.

TITLE: Investigations of the Physics of Reactors With Fast Neutrons.II (Issledovaniya po fizike reaktorov na bystrykh neytronakh)
(Continued from abstract 6/15)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 3, pp. 288-293 (USSR)

ABSTRACT: The reactivity and the kinetics of the reactor were measured. It could be shown that in the center of the active zone the weight of the 5 MeV neutrons is higher by ~15% than that of 250 MeV neutrons. The effective yield of the delayed neutrons in the reactor with a uranium shield exceeds that of a reactor with a copper shield by 1,4 times its amount.
Reactor BR-3:
The active plutonium zone is the same as in reactor BR-1. In the center of the reactor a water-uranium channel is provided, which is separated from the plutonium zone by a uranium layer

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Investigations of the Physics of Reactors With Fast Neutrons.I

The active zone may be surrounded by 2 mobile shields. Shield 1 consists of depleted uranium, and shield 2 of copper. An additional shield can be fastened on one side on to the shield with a diameter of 70 cm, so that total thickness can be increased to 60 - 100 cm. With this reactor investigations were carried out of: the spatial and energy distribution of the neutrons, of which the results are shown in a table for Pu^{239} (n,f), U^{233} (n,f), U^{235} (n,f), U^{238} (n,f), Np^{237} (n,f), Pu^{240} (n,f), U^{238} (n,γ), Au^{197} (n,γ), U^{238} (n,2n). Measurement of the conversion factor. The latter was determined experimentally as amounting to 2,4 to 2,5. It was also calculated by means of the multi-group computation method in S_4-th approximation (Ref 1). The electronic computer was used under the supervision of Professor Ye. S. Kuznetsov. For computation the experimental values for μ of V. I. Kalashnikova (Ref 5), G. N. Smirenkin (Ref 6), B. D. Kuz'minov (Ref 7), and for α the values obtained by P. Ye. Spivak (Ref 8), V. N. Andreyev (Ref 9) were used. As a result of computations the coefficient was found to amount to 2,6.

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Investigations of the Physics of Reactors With Fast Neutrons. II

~17% of the total volume of the active zone. The regulating rods (interior of shield) are made from a copper-nickel alloy. The external shield consists of uranium slugs canned with stainless steel. Thickness ~25 cm. The uranium shield is surrounded by copper of 15 cm thickness.
The presence of mercury in the active zone leads to a decrease of the content of fast neutrons in the spectrum. The conversion factor was 1,6 ± 0,2.
Theoretically the kinetic equation for this reactor was calculated by G. I. Marchuk according to the method developed by V. S. Vladimirov. Theoretical calculation of the critical mass was carried out with an error of 4%, and that of the effectiveness of the regulating rods with an error of 8%. The effective yield of the delayed neutrons was found to amount to 0,27%, while the experimental value was 0,24 ± 0,04%. There are 7 figures, 1 table, and 13 references, 9 of which are Soviet.

LEYPUNSKIY, A.I., red.; FURSOV, V.S., doktor fiz.-matem.nauk, red.; STENBOK, I.A., nauchnyy red.; ZAVODCHIKOVA, A.I., red.; FRIDMAN, V.Ya., red.; MAZEL', Ye.I., tekhn.red.

[Works of the Second International Conference on the Peaceful Uses of Atomic Energy. (Selected reports by foreign scientists)]. Trudy Vtoroi mezhdunarodnoi konferentsii po mirnomu ispol'zovaniiu atomnoi energii, Zheneva, 1958. [Izbrannye Doklady inostrannykh uchenykh]. Moskva, Izd-vo Glav.uprav.po ispol'zovaniiu atomnoi energ.pri Sovete Ministrov SSSR. Vol.3. [Physics of nuclear reactors] Fizika iadernykh reaktorov. Pod obshchei red. A.I.Leipunskogo i V.S. Fursova. 1959. 803 p. (MIRA 13:6)

1. International Conference on the Peaceful Uses of Atomic Energy, 2d, Geneva, 1958. 2. Deystvitel'nyy chlen AN USSR (for Leypunskiy). (Nuclear reactors)

LEYPUNSKIY, A. I.

21 (0), 24 (9)

AUTHOR: Tyagunov, G. A. SOV/89-7-2-18/24

TITLE: Scientific Conference of the MIFI (Nauchnaya konferentsiya MIFI)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 2, pp 176-177 (USSR)

ABSTRACT: The yearly scientific meeting was held from 17 April to 15 May 1959 in the Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physical Engineering Institute). More than 600 participants from 100 different institutes attended the 2 plenary and 18 sectional conferences. A total of 148 lectures were held. The following lectures are specially mentioned: M. K. Romanovskiy on the thermo-nuclear examinations, N. G. Basov on the physical foundations of molecular generators and amplifiers, A. I. Leypunskiy on the construction of a fast reactor, I. Ya. Pomeranchuk on the theory of the peripheral collision of mesons and nucleons, A. B. Migdal on superfluidity and momentum of inertia of the nuclei, A. S. Kompaneyets on the strong electromagnetic gravity wave, V. I. Gol'danskiy on levels which are excited within the nucleus shell and methods of comprehending them, I. L. Rozental' and L. A. Prokhorova on the analysis of the possible experiments for the determination of the measurements of the μ-mesons, V. I. Dianov-Klokov on the spectrum of liquid and

Card 1/3

Scientific Conference of the MIFI

crystalline hydrogen under pressure (8000-10000 atm) and an instrument for measuring the absorption curves, V. K. Lyapidevskiy and O. V. Glamazdina on new application possibilities of the diffusion chamber, A. V. Shal'nov on calculation methods for linear electron accelerators with migratory waves, P. A. Ryazin, A. B. Minervin and A. I. Zaboyev on new theories of the electron capture under betatron conditions of the acceleration, Ye. G. Pyatnov on optimum wave length for a generator, S. P. Lomnev and G. A. Tyagunov on magnetic focussing in a linear electron accelerator, O. A. Val'dner, P. A. Dmitrovskiy, D. M. Zorin, Yu. V. Mizin on the 3 mev linear accelerators of the MIFI, and V. V. Kuznetskiy, O. A. Val'dner, V. V. Kotov and V. N. Chesnokov on examination of the electron movement in the system of the elutron with consideration of the scattering fields, O. A. Krayev on impulse method for measuring the heat conduction capacity of liquids and the theory of this method, Ye. M. Khabakhpasheva, Yu. M. Il'in and D. A. Chirov on heat transmission to the eutectic Na-K which flows in a circular space, V. I. Petrovichev on heat transmission to circulating mercury, N. M. Royzin on special conditions when working with a flat triode in

Card 2/3

the impulse technique, O. S. Poturayev on calculation methods and construction of an impulse transformer for instruments with semi-conductor elements, Ya. A. Khetagurov on a possibility judge the characteristics of magnetic recording of impulses, B. I. Kal'nin on the element system for a universal digital computor, V. S. Malov on multiple control of the parameters of technologic processes, P. I. Popov on analysis of several systems with which physical energy apparatus can be automatically started, Yu. I. Topcheyev on a method to examine the quality of a reactor control when the reactivity changes stepwise or linearily. G. A. Leont'yev and A. I. Yevstyukhin on examination of the iodine method of refining niobium and characteristics of the metal obtained, P. L. Gruzin and G. G. Ryabova on examination of the micro-distribution of carbon, tungsten, iron and other elements in zirconium and its alloys by use of auto-radiography, G. B. Fedorov on determination of the sublimation heat of zirconium and nickel by using radioactive indicators and G. B. Fedorov and A. N. Semenikhin on determination of the diffusion coefficients of chromium, nickel, iron and chromium nickel steels. The literature for all these lectures will be published by the MIFI in a symposium.

LEYPUNSKIY, A. I., KUZNETSOV, V. A., ARTYUKHOV, G. Y., MOGILNER, A. I.
PROKHOROV, Y. A., STEKLOVSKIY, V. M., and CHERNOV, L. A.

"Experimental studies of some of the physical features of Beryllium-moderated intermediate reactors.

report submitted for the IAEA Seminar on the Physics of East and Intermediate Rm Reactors, Vienna, 3-11 Aug 1961.

Acad. Sci . USSR Moscow

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AUTHORS: Blokhin, G. Ye., Blokhintsev, D. I., Blyumkina, Yu. A., Bondarenko, I. I., Deryagin, B. N., Zaymovskiy, A. S., Zinov'yev, V. P., Kazachkovskiy, O. D., Kim Khen Bon, Krasnoyarov, N. V., Leypunskiy, A. I., Malykh, V. A. Nazarov, P. M., Nikolayev, B. K., Stavisskiy, V. Ya., Ukraintsev, F. I., Frank, I. M., Shapiro, F. L., Yazvitskiy, Yu. S.

TITLE: A pulsed fast reactor

X

PERIODICAL: Atomnaya energiya, v. 10, no. 5, 1961, 437-446

TEXT: The present paper gives a description of the pulsed fast reactor of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) which became critical in June, 1960. This reactor, called ИБР (IBR) reactor, serves as pulsed fast neutron source (mean power ≈1 kw) for physical investigations, particularly for time-of-flight experiments. Its most distinguishing feature is the very small contribution (~10^{-4}) of the delayed neutrons in its normal operation; it is about

Card 1/7 4

S/089/61/010/005/001/015
B102/B214

A pulsed fast reactor

one hundredth of that of the usual steady uranium reactor. The pulses appear because whenever the reactor becomes overcritical a burst of prompt neutrons results. The half width of these pulses is 36 μsec. The frequency with which the pulses are repeated can be varied between 8 and 80 pulses/sec. Fig. 2 shows the construction of this reactor. The periodic change in the reactivity is brought about by the displacement of the two U^{235} blocks placed in two disks that can be rotated. The main block is pressed in the form of a disk, 1100 mm in diameter, and can be rotated with a peripheral velocity of 276 m/sec (at 6000 rpm) during which it passes through the core center. The reactivity change obtainable from the motion of the main block is 7.4 %, that obtainable from the motion of the auxiliary block is 0.4 %. The stationary part of the core consists of plutonium lumps in steel jackets. The reactor is started by a rough regulator, in this case a movable part of the reflector. It gives a reactivity change at the rate of $13 \cdot 10^{-5} - 1.3 \cdot 10^{-5}$ sec^{-1}. The manually operated rod is also a part of the reflector. Two plutonium rods in electromagnetic suspension serve as scram. They can be separated from the core with an acceleration of 20 g. Their separation causes a reactivity

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decrease of 2-1.1 %; the rough regulator allows a reactivity change of 2.4 %, the manual regulator 0.1 %, and the automatic regulator 0.036 %. The reactor possesses also a reactivity booster for the production of one intensive pulse. The control and shield system is an automatically functioning electronic arrangement with BF_3 counters and ionization chambers. The whole reactor is placed in a room of size 10·10·7 m whose concrete walls allow complete protection from radiation. The most important experimental arrangement consists of a 1000 m long neutron conductor, a metal tube, 400 mm in diameter in the first part and 800 mm in the second part in which a pressure of 0.1 mm Hg is maintained. This conductor connects a chain of socalled "intermediate pavilions" (at distances of 70, 250, 500, 750, and 1000 m from the reactor) in which experiments can be carried out. There is also an additional neutron conductor of 100 m length. The reactor chamber is joined to an experimental chamber in which four neutron beams of up to 800 mm diameter are available. There us such an experimental chamber also above the reactor chamber. Various experiments were carried out with the reactor and they are described in the present paper. These are experiments with stand

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assemblies and slowly moving main block for the determination of the most important parameters of the reactor; experiments with a core assembly (unmoved), experiments with rotating (5000 rpm) main block and a Ra-α-Be source in the core for the investigation of the effect of the multiplication factor, etc. The most important results are represented graphically. For example, Fig. 8 shows the dependence of the half width θ of a pulse on the reactivity; the dashed line holds for the quasistationary case, the dot-dash line for the case of $\theta = K(\tau/\alpha)^{1/3}v^{-2/3}$, where v is the velocity of motion of the (rotating) main block; in the quasistationary case $\theta = 2\sqrt{\varepsilon_m/\alpha v^2}$, where ε_m is the reactivity at the maximal multiplication factor; $\varepsilon = \varepsilon_m - \alpha x^2$, where x is the displacement of the main block. The reactor has been actually used for the measurement of the total, scattering, capture, and fission cross sections by the time-of-flight method. Further experiments will be carried out with a view to obtaining increase of power and decrease of the pulse duration. There are 15 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: J. Orndorf, Nucl. Sci. and Engng, 2, No. 4, 450 (1957).

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27524
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21.1000

AUTHORS: Leypunskiy, A. I., Kazachkovskiy, O. D., Pinkhasik, M. S.

TITLE: The future of fast reactors

PERIODICAL: Atomnaya energiya, v. 11, no. 4, 1961, 370 - 378

TEXT: The obtaining of a higher conversion ratio, which is only possible with fast reactors, involves serious technical difficulties. One of the main problems is to find a good coolant. At present, sodium is the best of those produced and used on an industrial scale. Economic problems are, however, still unsolved. Since with a reactor of a given power the greater the energy intensity the smaller its size, fuel enrichment should be as high as possible. This requirement causes cooling problems and raises the cost of chemical reprocessing. These disadvantages can be reduced by increasing the burn-up fraction. The production of suitable fuel elements for this purpose presents a further problem. In the USSR these matters are studied on the research engineering reactor БР-5 (BR-5) (coolant: Na, maximum thermal power: 5000 kw, fast neutron flux: 10^{15} n/cm^2·sec) for the industrial development of fast reactors. This

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The future of fast reactors

reactor is designed for the study of: (1) heat transfer problems with radioactive sodium as coolant, (2) tests of specimens and prototype fuel elements, (3) the kinetics of fast reactors with high energy intensity, (4) materials under fast neutron fluxes and nuclear physics under these conditions. Plutonium oxide as a fuel has shown several advantages compared with metallic plutonium. The reactor core consists of 80 rod assemblies (stainless steel tubes filled with PuO_2), additional assemblies of rods of natural uranium and special assemblies with various samples exposed to fast neutron irradiation. The core itself has a cylindrical shape (280 mm high, 280 mm wide). Nickel was chosen as the reflector material. The maximum heat of 220 kw liberated in the reflector was carried off by forced draft air. The core was cooled by sodium flowing at a maximum speed of 5 m/sec (outlet temperature $\sim$500°C); in the second circuit, a eutectic fusion Na+K was used. In both circuits a total quantity of $\sim$5 m^3 of liquid metal circulated at a rate of 250 m^3/hr (circulation period $\sim$30 sec). One loop of the second circuit was cooled by air, the other incorporated a steam generator. The reactor was started in summer of 1958 (without coolant); in January 1959, the critical state

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in the sodium-filled system was attained. Operation commenced in the summer of 1959 (maximum power 5000 kw). Sodium proved to be a very good coolant, better than the Na-K alloy. With the aid of cold traps the oxide concentration in the coolant could be kept at $\sim(1\text{-}3)\cdot10^{-3}$%. By June 1961, a maximum burn-up fraction of more than 4% was reached. The integral fast-neutron flux exceeded $2\cdot10^{22}$ n/cm^2 at that time. No Pu impurities were detected in the cooling system. The advantages of the ceramic fuel (oxide) were confirmed. Stability and safety tests were also made. All experiments indicate that the first future task will be to solve the question of costs in cooperation with industry. The performance of the BR-5 reactor was nearly the same as that of a power reactor. The most important parameters of the BR-5 reactor are compared with those of a 750-Mw fast reactor: Energy intensity 360 (600) kw/liter; coolant temperature at the outlet from the reactor: 500 (550) °C; burn-up fraction $\geq$4 ($\sim$5) %. Since fusion reactors have not yet been achieved, fast reactors are the most promising type for future development in view of their high breeding ratio. For fuel reprocessing, pyrochemical or electrochemical methods should be used. There are 4 figures, 3 tables, and 5 references: 4 Soviet and 1 non-Soviet. The latter reads as

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The future of fast reactors

follows: Directory of Nuclear Reactors, Vol. VI, IAEA, Vienna, 1959.

SUBMITTED: July 17, 1961

Data of USSR Reactors

	Thermal power reactors		Fast power reactors
	Beloyarsk	Novo-Voronezh	Projected reactor (USSR)
Thermal power, Mw	285	710	750
fuel	U^{235}	U^{235}	U^{235}
fuel concentration in the core, g/liter	5	34	625
enrichment, %	1.3	1.5	21.6
coolant	water	water	sodium
energy intensity, kw/liter	1.2	43	600
specific power, kw/kg	250	1200	950

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21406
S/089/61/011/006/002/014
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21.1000

AUTHORS: Leypunskiy, A. I., Abramov, A. I., Alek androv, Yu. A., Anikin, G. V., Bondarenko, I. I., Guseynov, A. G., Ivanov, V. I., Kazachkovskiy, O. D., Kuznetsov, V. F., Kuz'minov, B. D., Morozov, V. N., Nikolayev, M. N., Sal'nikov, O. A., Smirenkin, G. N., Soldatov, A. S., Usachev, L. N., Yutkin, M. G.

TITLE: Investigation of the BR-5 (BR-5) fast reactor (spatial and energy distributions of neutrons)

PERIODICAL: Atomnaya energiya, v. 11, no. 6, 1961, 498 - 505

TEXT: The fast research reactor BR-5 and its experimental equipment is described in brief and some of its neutron spectra are given and discussed. The following data are given: fuel - plutonium oxide; coolant - sodium; reflector - thin layer of natural uranium plus thick layer of nickel: power - 5000 kw. The reactor has many vertical and horizontal holes for technical and physical studies and is well supplied with experimental equipment. Leypunskiy gave a detailed description of the BR-5 reactor at

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the Second Geneva Conference (1958). Inside the core the neutrons have energies of more than 100 kev which they lose almost completely in passage through reflector and shield. In the outer layers of the shield, their mean energy does not exceed some tens of ev. In the kev range (E_n>50 kev) spectra were measured for the most important beams and channels. For the other cases, they were determined from threshold reactions. The soft part of the spectrum within the reflector was determined from the spatial distribution of neutrons with $E_n \approx 5$ ev, recorded with gold resonance indicators. The total neutron flux was determined only at the points where the Pu^{239} fission cross section was constant. Direct neutron spectrum measurements were carried out in a vertical (OK-70) and a horizontal (B-3) channel using (He^3+Ar)-filled ionization chamber in the first case and the neutron transmission method with n-hexane in the second. The neutron spectrum of the horizontal channel was also determined by photoemulsions. From the rates of indicator and fission reactions $Au^{197}(n,\gamma)$, $U^{235}(n,f)$ $Pu^{239}(n,f)$, $Th^{232}(n,f)$, $Na^{23}(n,\gamma)$ $Cu^{63}(n,\gamma)$, and $Al^{27}(n,\alpha)$ the abrupt

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drop in neutron energy in the Ni reflector was determined, and the activity caused by resonance neutrons (E_n = 4.9 ev). The fast neutron flux ($E_n > 1.4$ Mev) in the core center was found to be $(2.4 \pm 0.2) \cdot 10^{14}$, and total flux was $(8.2 \pm 0.3) \cdot 10^{14}$. Experimental results were verified by energy-group calculations (18 groups). Good agreement between theory and experiment was also found for the channel spectra. The authors thank D. S. Pinkhasik, N. N. Aristarkhov, and the reactor personnel for assistance. There are 10 figures, 2 tables, and 2 Soviet references.

SUBMITTED: August 17, 1961

Table 1. Reaction cross sections in the core center.

Legend: (1) Reaction; (2) experiment; (3) σ calculated, given in barns.

Fig. 7. Neutron transmission spectrum (n-hexane) for the horizontal channel B-3.

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LEYPUNSKIY, A. I.

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo instituta (Scientific Conference of the Moscow Engineering Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fiveyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of subcritical plasma;

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LEYPUNSKIY, A.I., KAZACHKOVSKIY, O.D., PINKHASIK, M.S., ARISTARKHOV, N.N., KARPOV, A.V., LARIN, YE.P., YEFIMOV, I.A.

Operating experience with the BR-5 reactor.

Report submitted for the Conference on Operating experience with power reactors, Vienna, 4-8 June 63